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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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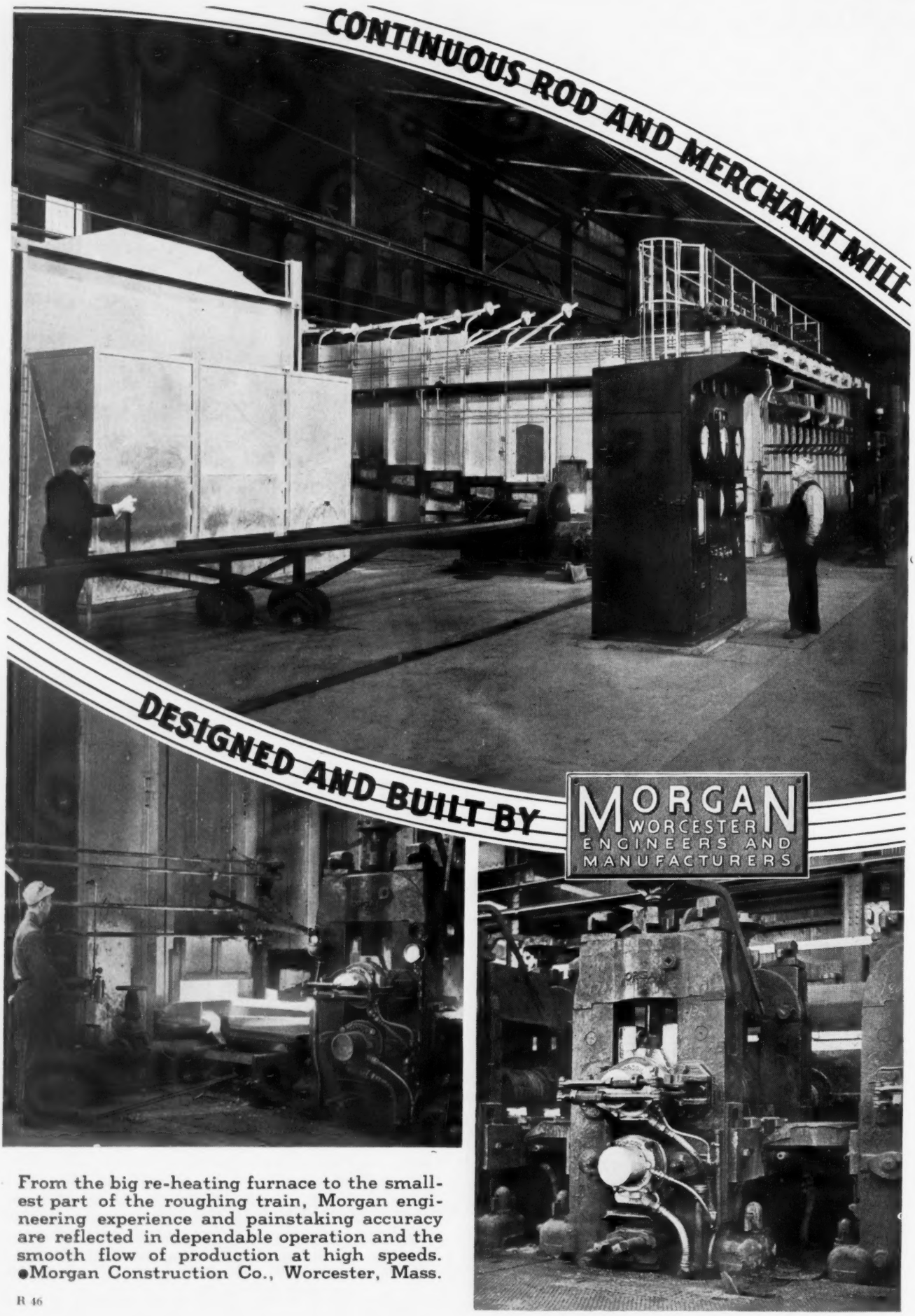
PRODUCTION · PROCESSING · DISTRIBUTION · USE



From the big re-heating furnace to the smallest part of the roughing train, Morgan engineering experience and painstaking accuracy are reflected in dependable operation and the smooth flow of production at high speeds. ●Morgan Construction Co., Worcester, Mass.

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STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ LAST WEEK'S volume of business again registered a mild gain. Steel production (p. 19) moved up 2 points to 48 per cent of ingot capacity. STEEL'S index of industrial activity (p. 33) now stands at 72.9 per cent as compared with 95 a year ago. The mercury in STEEL'S industrial weather thermometer (p. 34) slowly is moving toward the "active" zone. The index for foundry equipment demand (p. 23) is mounting. . . . Significant development in the steel industry is the big increase (p. 31) in the proportion of steel products now being transported along inland waterways. . . . An important meeting at Pittsburgh in October (p. 31) will be devoted to instrumentation as a means of obtaining better control in steel production; another meeting in New York in November will be devoted to methods of keeping down unit costs.

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What is the definition of the term "interstate commerce"? This is a question plaguing the new hour and wage administration. This new agency (p. 22) plans to employ economists who will specialize on different industries; there will be one for steel. . . . Mystery surrounds the national economic committee's refusal (p. 21) to divulge names of manufacturers who have been subpoenaed to answer questions at its coming hearings. Industry is advised (p. 23) to co-operate fully with the committee, particularly in replying to questionnaires which now are being mailed to some 2300 trade associations. . . . Statistics to date for the Weirton Steel Co. NLRB hearings (p. 17) are: 180 trial days, 31,919 pages of testimony, 473 witnesses and 3721 exhibits; the end is not yet in sight.

Economists For Steel

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Affairs of corporations in the future (p. 15) will be conducted in a goldfish bowl for all to see; there, like Caesar's wife, they must be above suspicion. Any business has to sell far more than merely the product which it makes; it has also to sell its contribution to our standard of living, its contribution to employment and economic stability, and its contribution to the general progress and advancement of the community in which it is located. Existing and threatened government competition with private enterprise (p. 13) must be eliminated. . . . The public must be given the facts. The rank and file of our people will not rise militantly to the defense of the free enterprise system unless they can see the relation between its continued operation and their personal well-being.

Public Must Be Assured

• • •

The new "superfinishing" method by which wearing surfaces are subjected to light abrasive treatment that scours off peaks left after machining now is used (p. 36) in finishing a variety of parts. Scratches that remain after superfinishing are below the final surface, serving as reservoirs for lubricants. The process practically eliminates "wearing in" of bearing and other surfaces. . . . New quick-drying solution (p. 39) forms a coating resistant to acid or alkali corrosive agents in concentrations up to 20 per cent . . . . As the result of progress in controlling variables some steel companies now obtain (p. 40) increased open-hearth yields and steel of better quality by use of desulphurizing agents. Any specifications down to 0.02 per cent sulphur can be met uniformly.

Finishing Method

• • •

Notable progress in several important phases of foundry metallurgy (p. 43) and in steelworks refractories (p. 54) were revealed at recent meetings. . . . Better understanding of hard surfacing materials and methods of application (p. 45) is bringing reduced maintenance on many different types of equipment. . . . Failure of concrete due to shrinkage is avoided, it is said, if mixed (p. 46) with a new compound. . . . More effective use of floor space and a lower inventory have resulted at a large electrical plant (p. 48) where a 3700-foot chain conveyor serves 17 stations in eight buildings . . . . Maintenance of proper temperature in the bath is of vital importance (p. 50) in producing galvanized surfaces free of defects. A number of factors must be considered.

Progress In Foundries

E. L. Shaner

Production Costs Cut with Certified Alloy Steels

You can depend on better results in less time when your heat treater is guided by the Ryerson alloy data charts. These charts show him the exact properties of the steel with which he is working and tell him how to get the desired results. He does not have to test. He takes no chances. Spoilage is eliminated and a sound dependable job of high accuracy and uniformity is assured.

In addition to saving in production costs, the Ryerson Certified Alloy plan benefits the Purchasing Department as they can keep a detailed record of the exact analysis of every alloy purchased. Thus it is possible to duplicate particularly desirable close range specifications on repeat orders.

The Metallurgical Department is benefitted too for they can call for any reasonable physical requirement and be sure the Heat Treater can produce the desired result.

Ryerson Certified Steels also include carbon, tool and stainless steels that meet definite quality standards. They offer many advantages to steel users. Let us tell you the complete story. Write for booklet.

RYERSON *Certified* **STEELS**

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON R CERTIFIED STEELS

Principal products in stock for Immediate Shipment include—Bars, Structurals, Plates, Iron and Steel Sheets, Tubing, Shafting, Strip Steel, Alloy Steels, Tool Steels, Stainless, Babbitt, Welding Rod, etc.

Management Appraises Social, Economic Problems at Washington Conference

WASHINGTON

■ NEARLY 2000 delegates convened in Washington last week for the seventh International Management congress, the first ever held in the United States. Almost one-fourth came from foreign countries.

Discussion took two forms—policy and administration and technique. Labor problems and the threat of government encroachment on free enterprise consumed a major part of the sessions.

Program was divided into six sections — administration, production, distribution, personnel, agriculture and home management. Five meetings were held by each section; ten general sessions were held from Monday through Friday.

Existing and threatened government competition with private enterprise must be eliminated to safeguard continuance of free enterprise, declared Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and president, National Association of Manufacturers.

The public, he said must be given the facts about the free enterprise system. If the system is to continue, government expenditures must be limited "to those needed for the economical administration of the legitimate functions of government, together with adequate relief appropriations for the unemployed.

Taxes Exceed Dividends

"Extent of the current tax burden on industry may be seen in a recent analysis of the reports of 150 representative companies showing total taxes paid in 1937 were more than double the 1932 figure. Actually, taxes amounted to 34 per cent more than the dividends paid to 5,500,000 holders of common stock in these companies."

Mr. Hook told the congress that "it is not reasonable to expect the great rank and file of our people will militantly rise to the defence of the free enterprise system unless they can see the relation between its continued operation and their personal well being.

"The rise of pseudo economists and irresponsible promisers seeking leadership and power make the job of the realist, the student and the true patriot difficult indeed. We will not swell the army of truth nor add to the legions of understanding and progress by mere criticism or attempting lightly to wave aside the pronouncements of the antagonists of free enterprise."

Sees Further Expansion

Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt., made a plea for revival of initiative and enterprise in American business and industry. He expressed the belief the country's physical resources, technical progress and population justified preparations for expansion, both in standards of living and in industrial activities.

Mr. Flanders declared business leadership has been lacking in the spirit of enterprise since 1929. Granting there were various explanations for this, he insisted the limits of the country's productivity had yet to be reached. As a means towards effective realization of existing possibilities, he advocated a clearer understanding of the need for a balance between security and incentive.

Admitting society's obligation to youth, the unemployed, the underprivileged and the aged, Mr. Flanders was, nevertheless, critical of the view points of "the social worker whose mind is fixed on security alone," and of "the politician who finds the easy road to maintenance of power that of the promise of security."

Incentive must be provided, he declared, both for "the routine worker whose principal desire is for steady work at good pay," and for the ambitious worker who is "desirous of assuming responsibility and of expanding his responsibility to the limit of his powers."

"We may almost say," Mr. Flanders declared, "that the day of the capitalist has passed. Ownership is no longer as a rule vested

Steel House Floats—"with Greatest of Ease"

■ **This eight-room, all-steel structure, weighing 41 tons, was built recently by LeTourneau Co., Peoria, Ill. The house was launched, floating from its own buoyancy, drawing only 8 inches of water, and was towed to a residence site across the river**

in powerful individuals. Ownership is continuously more subdivided and fractionated. The opportunities of management are increasingly more and more open to those who can only gain them by other means than by inheritance."

Labor unions, the speaker declared, are making mistakes in placing emphasis too strongly on security, particularly when competition between industries on the matter of wages results. As a solution, he recommended that unions should concern themselves with steps that lead to competition "in equipment and management whereby high wages can be paid, low prices maintained, the general purchasing power increased, and the standard of living raised."

Business was urged by A. W. Robertson, chairman, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to stand by its colors in guarding against regimentation.

"Free enterprise," he said, "may confidently hold up its head as representative of one of the most vital functions in our national economy today. It is the one thing which stands between us and a stale, flat, unhappy world of universal regimentation and individual conformity to a single pattern."

Mr. Robertson characterized the charge that business was responsible for unemployment as "grossly unfair."

"Private enterprise," he continued, "is engaged in providing goods and services for others in a highly competitive market. If the public or consumer wants the goods and services and buys them, then business has need for labor and can give employment, but unless it can sell its product first it cannot give employment.

Cites Management's Responsibilities

Granting management in times past had been "guilty of day-to-day existence," Mr. Robertson expressed hope that some means might be developed to smooth out the ups and downs of labor.

"If management holds out the hope of employment today," he said, "it must not shatter that hope tomorrow. Management should be able to plan its work so that improvements, major repairs and expansion is done in periods of depression when labor might otherwise be unemployed. This means that private enterprise must have sufficient funds to carry it through depressions with confidence."

Describing social conditions as a "collateral responsibility" of management, Mr. Robertson advocated the comfort and health of every community be accorded constant attention.

"Management is not directly responsible for the social conditions, which are the indirect result of its factories and production methods, but it nevertheless must accept a fair share of the responsibility for these indirect results.

"Just as it has long since accepted the responsibility of securing safe and healthful surroundings in which men work," he added, "it must now accept the responsibility of helping employes secure safe and healthful surroundings in which to live."

Government Needs Management

Mr. Robertson made a plea for better co-operation between business and government.

"Inasmuch as government is forced by the very nature of things to assume a larger and larger role in our everyday life, regulating more and more what we do and how we live, it needs the assistance of management more than the government of any other age. Management should willingly offer its talents and services to government because management is the only source from which government can get the necessary talent to operate its many activities efficiently.

"Modern government cannot exist," he continued, "without better management. Management must accept its responsibilities and offer its services to any good government that asks for them. Government has a proper field of regulation which management recognizes and accepts. It is equally true that management has a field of accomplishment which government now lacks and would do well to recognize."

Lewis H. Brown, president, Johns-Manville Corp., New York, talked to the delegates on the common ground between management and labor.

Modern managers, he said, really "are scientific specialists. These new industrial executives differ widely from the owner-managers who preceded them in the ideas, ethics, social concepts and methods of management. In the complete industrial society under which we now live, management no longer represents, as formerly, a single interest; increasingly it functions on the basis of a trusteeship, endeavoring to maintain a proper balance of equity between the shareholders, the jobholders, the customers and the public."

Mr. Brown contended today's primary need is for affirmation of "those principles upon which government and business, labor and agriculture can work together in the solution of a common problem.

"Once we are agreed upon our true objectives a national unity of action will bring lasting business recovery. Without business recovery based upon sound national policies, there can be no stability, no security—nor can liberty itself be long preserved."

Dealing with the conflicts between business and labor and between business and government, Mr. Brown termed each "a strange paradox," and expressed belief that both were susceptible of solution. Apparent controversy and strife between business and labor he described as "birth-pains which are completely deceptive of what is really taking place." Confusion and recrimination in the relationships of business and government, he characterized as "the reopening of that old argument —is government the servant or master of men?"

"A new order of things is emerging," he said, "but as yet this new order has been obscured by dust clouds of words from political demagogues and radical agitators who have sought to extract personal advantages from the existing confusion. I venture the statement that, once the commotion subsides, those who have the interests of labor sincerely at heart and those who, no less sincerely, guide the destinies of industry, will be found nearer to fundamental agreement and accord than they have ever been before.

"This new concept of mutuality of interest, this goal of constructive collaboration," he added, "is foremost among the aims of enlightened industrial management. No one minimizes the difficulties that still lie ahead. Many clearly antisocial practices, such as sitdown strikes, lockouts, production sabotage, and gangster methods and labor racketeering must be eliminated. But if we work sincerely and honestly toward constructive industrial co-operation, that co-operation will in the end be achieved."

Technology Can Help

Technology can be counted on to function as a force toward solution of current social problems, said Dr. Karl T. Compton, president, Massachusetts Institute of Technology, Cambridge, Mass.

Dr. Compton took cognizance of the contention new machines are responsible for unemployment by insisting "technological unemployment" was "a myth" because "statistics show no decrease in the fraction of our population gainfully employed during the last few generations in which machine production has become important." He conceded, however, that technological changes do seriously affect communities and crafts and pointed out that overall statistics are "of small comfort to the families whose wage earners have lost their jobs."

Various methods are available for

(*Please turn to Page* 81)

Tell Industry's Story, Girdler Urges Advertisers

■ KEEPING American industry sold to the public looms as management's most important sales job today. This was the consensus at the sixteenth annual conference, National Industrial Advertisers' association, Hotel Statler, Cleveland, last week.

Merely selling industry's products no longer suffices, warned T. M. Girdler, chairman, Republic Steel Corp., Cleveland, and president, American Iron and Steel institute.

Business' critics have been feeding the people an "amazing and continuous diet of misinformation and misrepresentation," he declared. "Are we going to sit back and let the public absorb this diet without making any concerted effort to bring out the truth?"

Other speakers also emphasized necessity for aggressive campaigns —to tell employes, customers and neighbors about industry, its accomplishments, problems, products.

Vast expansion of American industry, said Col. Willard T. Chevalier, publisher, *Business Week*, has resulted in a national dependence upon products and services.

"It has established so close a relationship between business and the citizenry, between business and government, that every American corporation has become a matter of public concern.

"No company official can longer look upon his policies and practices as his own affair exclusively, in which he is responsible only to the board of directors. It is becoming apparent that affairs of corporations in the future will be conducted in a goldfish bowl for all to see. There, like Caesar's wife, they must be above suspicion."

Mr. Girdler credited advertising with a major part in present day civilization. It has, he said, broadened markets, blazed the way for new products, stimulated competition.

Must Build Good Will

"Business long ago learned to recognize the direct relationship between good will and sales, but today we are face to face with the necessity of building public good will for industry, not alone for sales but to preserve the very system of free enterprise under which we exist and do business. Whether we like it or not, that is our big job today.

"We must freely admit that under modern conditions certain reasonable government regulations may be in the public interest. And those that are in the public interest should be welcome. But if private enterprise is to function, these regulations must stop short of drastic controls which make profitable operation impossible and, actually or in effect, destroy private industry. . . .

"From the pronouncements of many of the men who are reputed to steer much of the New Deal thinking, it seems apparent that behind the scenes lies the philosophy that the public would be better off if many of our important industries were to be taken out of the hands of their present managers and placed under control of government bureaus. . . .

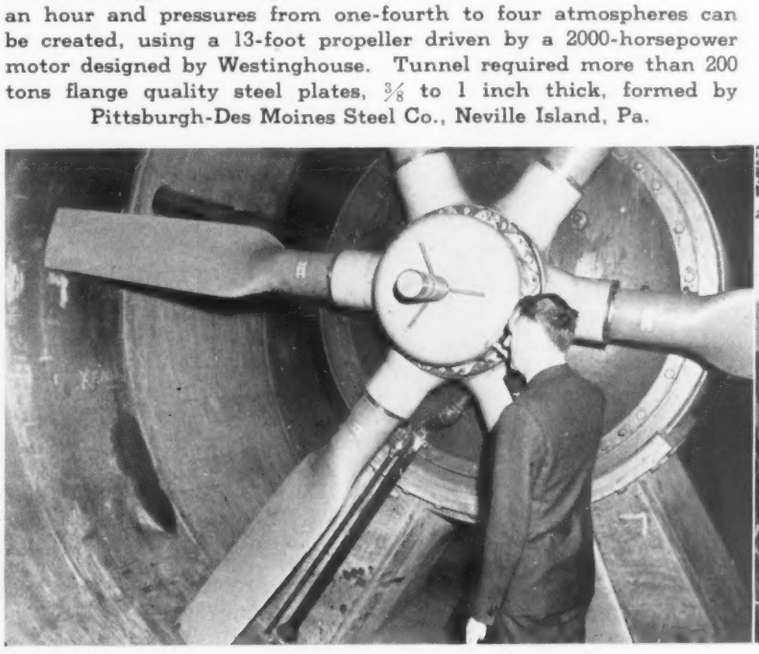
"And all this is being done under the guise of liberalism. I have long been looking for a proper definition of the term 'liberal.' It is my observation that it applies chiefly to those who believe in being 'liberal' with the taxpayers' money.

"Business is deeply conscious of the serious problem facing our country—problems arising from wide unemployment and the desire of millions of people to be assured of some form of security. But the mere spending of millions for government projects is a temporary remedy, not a permanent solution. A much nearer approach to a permanent solution would be found in greater production of goods, more work for those who want work and increased confidence on the part of capital.

"National policies which fail to promote these objectives cannot be called constructive. National policies which tend to curtail the liberties of citizens and place free en-

Packaged Typhoon To Test Aircraft Models

■ Substratosphere conditions for testing aircraft models are simulated in this welded steel pressure wind tunnel at Massachusetts Institute of Technology, Cambridge, Mass. Wind velocities up to 400 miles an hour and pressures from one-fourth to four atmospheres can be created, using a 13-foot propeller driven by a 2000-horsepower motor designed by Westinghouse. Tunnel required more than 200 tons flange quality steel plates, ⅜ to 1 inch thick, formed by Pittsburgh-Des Moines Steel Co., Neville Island, Pa.



terprise at the mercy of powerful bureaus cannot be called liberal. When that is done in other countries we recognize it for what it is —some form of collectivism.

"Whether or not we ever go to that extreme in this country rests entirely with public opinion. That is the court of last resort. The whole question revolves around which policy is preponderantly in the public interest—which can contribute more to the welfare of the average person.

"We have already had the answer, clear and unmistakable, with respect to some of the anti-industry measures that have been adopted. The shining example is the Wagner act, which was handed to the country with the assurance that it would usher in a great period of industrial peace. The fruits of that one-sided law and its biased administration are seen in the unparalleled labor conflict in all parts of the country, and the bitter warfare going on between the labor unions.

"The demand for drastic changes in that law is nationwide and insistent."

Just as labor has been disappointed through the workings of the labor relations act, so will the general public learn much recent "liberal" legislation will not work for the common weal, predicted Mr. Girdler.

"Private industry has an impressive record of vast and solid achievement. While admitting all its human failures and defects, and laying no claim whatever to perfection, it can prove beyond all question that its contributions to mankind have exceeded those of any other system ever known.

"That story in all its amazing ramifications should be told by every industry in season and out of season. It can be told simply and effectively by giving the public the facts about industry in order that public opinion may be enlightened and not misled. . . .

Recognizes Social Problems

"I say, without fear of contradiction, that the business interests of this country are completely in accord with the objective of lifting the buying power of all the people to the highest possible level—the more abundant life, if you will. I repeat they fully recognize the seriousness of the social problems of unemployment and insecurity, but they are opposed to methods supposedly aimed at solving these problems, which really do nothing of the sort —methods which are leading to lower standards of living and a more barren life for the American people. . . .

"Any business has to sell far more than merely the product which it makes. It has also to sell its contribution to our standard of living, its contribution to employment and to economic stability, and its contribution to the general progress and advancement of the community in which it is located."

The steel industry, continued Mr. Girdler, has awakened to the importance of the problem. The industry is telling the public what steel is, what it does for civilization, what it means to steel-producing communities, how steel conducts its business.

"In conclusion, let me repeat to you that today it is not sufficient to confine your efforts to conveying the excellence of your products.

"Today it is vital that you bear constantly in mind the necessity of presenting your company and your industry to the general public, in terms of the contributions which your company and your industry have made and will continue to make to the comfort, convenience, progress and prosperity of mankind.

"You and I and everyone in industry have the obligation to take up our share of the burden in defending the institutions upon which our industries rest. Just as in merchandising and advertising we take the long look which goes beyond the immediate buyer to the final consumer, so in presenting the facts about our business, we should bear in mind that great mass of people whose composite views make up public opinion and whose votes constitute the final word of control over the policies of the nation."

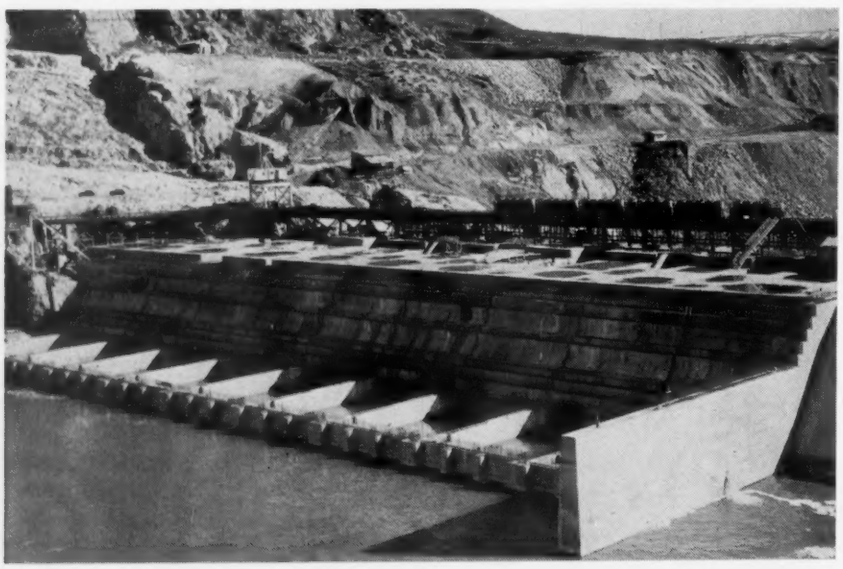
Richard P. Dodd, Truscon Steel Co., Youngstown, O., and vice president, N. I. A. A., highlighted association activities, reviewed N. I. A. A.'s contribution toward more effective industrial advertising.

Frank Wyse, Bucyrus-Erie Co., South Milwaukee, Wis., association president, pointed to the trend to institutional advertising, not only for profit but also for prestige.

Publication of a new source book of industrial marketing statistics, the *Industrial Market Data Handbook*, was announced by Wilford L. White, chief, bureau of foreign and domestic commerce.

Stanley A. Knisley, Republic Steel Corp., Cleveland, was elected president of the association. Vice presidents: Charles McDonough, Combustion Engineering Co. Inc., New York; Richard P. Dodds, Truscon Steel Co., Youngstown, O.; Theodore Marvin, Hercules Powder Co., Wilmington, Del.; Wm. D. Murphy, Sloan Valve Co., Chicago; V. R. Young, Canadian General Electric Co., Ltd., Toronto; Herbert V. Mercready, Magnus Chemical Co., Garwood, N. J.; secretary-treasurer, A. E. Hohman, Blaw-Knox Co., Pittsburgh. The association will hold 1939 annual meeting in New York.

Stainless Steel Guards Coulee Dam Against Seepage



■ **Stainless steel vertical expansion joints are used in Grand Coulee dam, Washington, to safeguard expansion and contraction. Sections 65 feet long are separated by a corkboard joint 1 inch thick. Near the water face and below high tail water, a stainless steel seal is placed on each side of a diamond-shaped asphalt seal formed in the concrete, shaped to allow expansion movement. The two metal seals and the asphalt provide three separate guards against seepage of water into the expansion joints. Photo, Republic Steel Corp.**

180 Trial Days; 31,919 Pages of Testimony—a Labor Board "Hearing"

■ ARGUMENTS on pending motions to strike out testimony in the Weirton Steel Co. case will be heard in Washington, Sept. 27, according to revised plans announced by the national labor relations board. Following the Washington hearing, a date for resumption of the hearing proper in Pittsburgh will be announced.

The case's history: Charges against company preferred by SWOC in May, 1937; complaint served on company by labor board Aug. 1, 1937; hearing started Aug. 16, 1937, in New Cumberland, W. Va.; transferred to Steubenville, O., Sept. 13; labor board completed its case Feb. 28;

Company and intervenors opened defense April 5; on July 11, Trial Examiner Edward G. Smith ordered Clyde A. Armstrong, Weirton chief counsel, excluded from further participation; company appealed trial examiner's ruling to the board July 20; board upheld exclusion ruling July 25.

Comparative statistics to date:

	For Board	For Weirton	Total
Trial days	119	61	180
Pages testimony..	21,827	10,092	31,919
Witnesses	316	157	473
Exhibits	3,601	120	3,721
Objections, motions:			
Sustained	893	498	1,391
Overruled	732	5,312	6,044

Among the most important of SWOC's charges:

1. That Weirton employe representation plan and Weirton Steel Employes' Security league—independent organizations—were not bona fide collective bargaining agencies but were controlled, dominated and financed by the company.

2. That the company resorted to various means to keep SWOC organizers out of Weirton and to discourage its employes from joining SWOC.

3. That the company dominated practically every phase of life in Weirton and surrounding communities including civic organizations, as well as courts, juries, police and fire departments and public elections.

In addition, about 300 individuals were named in the bill of complaint as former employes who had lost their jobs because of affiliation with the SWOC.

FALK CORP. RULE BOOK AIDS EMPLOYE RELATIONS

Falk Corp., Milwaukee, has prepared a rule book for employes, stressing safety and harmony in working relationships. Employes are told rules were set up to insure a safe place to work, a plant where chance of occupational injuries and diseases are minimized, and employment with good opportunities for individual advancement and reasonable job security.

The aim is to provide a place where "the present long standing satisfactory relationship between employer and employe will not be jeopardized by misunderstandings and a lack of mutual respect, which always bring about serious consequences and have an adverse effect upon the employes as well as on the company."

FINANCIAL

■ SUPERIOR STEEL CORP., Pittsburgh, had net loss in July of $19,030, less than half the monthly average for the first half this year. For the seven months ended July 31, net loss was $281,488. Stockholders will vote Oct. 10 on increasing bonded indebtedness to not more than $2,000,000, the issue to be secured by a mortgage lien on all real estate, plants and improvements.

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Colorado Fuel & Iron Corp., Denver, in the 12 months ended June 30 had a net loss of $829,363, after all taxes, interest and other charges, including provision for depreciation and depletion in the amount of $1,265,913. The loss equals $1.47 per share on the 563,620 shares outstanding. No dividends were declared or paid, but the full interest on the general mortgage 5 per cent bonds, due in 1943, and on the 5 per cent income mortgage bonds, due 1970, was paid on respective interest dates. Net working capital amounted to $9,774,207.

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Keystone Steel & Wire Co., Peoria, Ill., has declared a dividend of 10 cents a share on common stock, payable Nov. 1 to stockholders of record Oct. 13.

Buick's Goal for 1939 Season: 200,000 Cars

■ Buick's goal for 1939 model season is 200,000 cars, H. H. Curtice, president and general manager, said at the press preview in Flint last week. This contemplates a 25 per cent increase over 1938 and would be about 25 per cent of sales in Buick's price class.

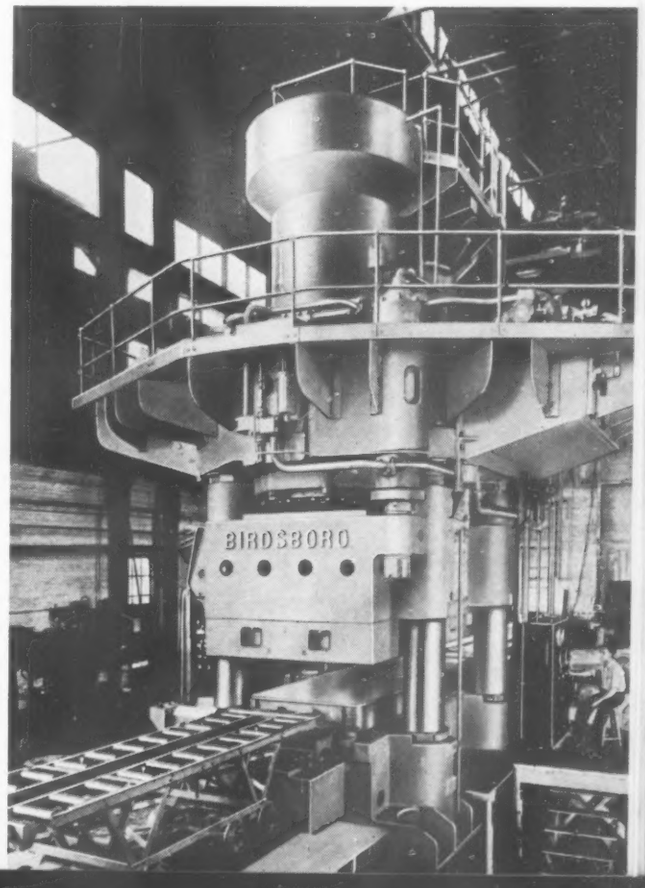
Already Buick assembly lines have been placed on two shifts and schedules for October and November increased sharply.

Improvements in the new models include stronger and lighter frames, new type "crown" clutch with only nine parts as against 41 formerly, more rigidly supported spring systems, optional "sunshine" roofs of the sliding panel type on certain models, 28 per cent increased glass area in windshields, new carburetors, gearshifts on steering columns, lower floor level, and optional "economy ratio" rear axles.

✦

"Largest Press For Plane Parts"

■ **Exerting 5500 tons working pressure on a platen 90 by 200 inches, this press is reported to be the world's largest for shearing and forming airplane parts. Speed and pressure are finger tip controlled, and operation is manual or automatic. Synchronized transfer simultaneously loads and removes finished work. It is one of a number for the Russian government, designed and constructed by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.**



August Exports Down Slightly

■ STEEL and iron exports, excluding scrap, in August amounted to more than 100,000 tons for the twenty-third consecutive month, according to the metals and minerals division, department of commerce.

Shipments totaled 134,110 tons valued at $8,810,935, compared with 137,276 tons valued at $9,832,797 in July, and 408,081 tons valued at $24,119,200 in August, 1937, when exports were close to a record level.

Pig iron furnished the largest tonnage in August, 19,756 tons. Japan took 18,949 tons. Rail exports aggregated 12,665 tons, compared with 1960 tons the preceding month and 7890 tons in August, 1937. The August shipments were largely relaying rails, Hong Kong taking 8317 tons, China, 2318 tons and the United Kingdom, 1200 tons.

Tin plate exports fell to 9163 tons, from 12,802 tons in July and 29,170 tons in August, 1937. Canada took 2528 tons, Union of South Africa, 855 tons, and the Philippines, 771 tons.

Exports, except scrap, in eight months totaled 1,388,752 tons valued at $93,997,890, compared with 2,242,831 tons valued at $136,709,284 in the corresponding period of 1937.

Scrap exports in August were 108,029 tons valued at $1,478,545. The July figures were 126,423 tons valued at $1,667,487. Japan took 44,221 tons, Germany, 28,355 and Italy, 20,072. Scrap shipments for eight months totaled 2,032,765 tons valued at $31,762,076, compared with 3,075,699 tons valued at $61,149,443 in the corresponding months of 1937.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Aug., 1938	July, 1938	Jan. thru Aug., '38
Pig iron	19,756	10,371	245,907
Ferromanganese and spiegeleisen	2	4	226
Other ferroalloys	95	51	801
Ingots, blooms, etc.:			
Not containing alloy	539	17,779	136,736
Alloy, incl. stainless	178	83	5,160
*Steel bars, cold-fin.	812	1,870	10,888
Bars, iron	49	36	943
Bars, concrete	2,870	2,199	13,336
Other steel bars:			
Not containing alloy	7,834	5,019	75,178
Stainless steel	53	14	278
Alloy not stainless	269	295	2,806
*Welding rods, electric	64	132	731
Wire rods	357	1,312	18,636
Boiler plate	431	193	5,173
Other plates, not fab.:			
Not containing alloy	12,118	16,000	125,479
Stainless steel	7	2	143
Alloy, not stainless	19	82	1,993
Skelp iron or steel	2,614	1,023	10,255
Sheets, galv. iron	406	272	2,678
Sheets, galv. steel	4,539	7,821	45,791
Sheets, "black" steel:			
Not containing alloy	11,650	13,934	124,609
Stainless steel	120	110	1,420
Alloy, not stainless	179	8	2,476
Sheets, black iron	881	678	4,981
Strip steel, cold-rolled:			
Not containing alloy	2,037	1,185	16,496
Stainless steel	13	37	290
Alloy, not stainless	25	27	171
Strip steel, hot-rolled:			
Not containing alloy	2,792	1,417	21,031
Stainless steel	1	43	104
Alloy, not stainless	3	3	45
Tin plate, taggers' tin	9,163	12,802	111,192
Terne plate	372	360	3,289
Tanks, except lined	5,301	2,466	25,123
Shapes, not fabricated	4,032	6,173	59,493
Shapes, fabricated	2,692	1,998	24,116
Plates, fabricated	575	1,113	18,155
Metal lath	25	61	613
Frames and sashes	149	155	976
Sheet piling	599	83	2,551
Rails, 60 lbs.	1,406	371	33,836
Rails, under 60 lbs.	71	962	3,997
Rails, relaying	11,188	627	15,461
Rail fastenings	918	724	4,908
Switches, frogs, etc.	81	110	1,174
Railroad spikes	762	162	1,855
R. R. bolts, nuts, etc.	182	46	659
Boiler tubes, seamless	614	572	8,741
Boiler tubes, welded	23	26	1,350
Pipe:			
S'ml's cast'g, oil-line	2,921	3,153	36,260
Do. welded	129	69	9,248
Seamless black, except casing	517	773	4,906
Pipe fittings:			
Mall. iron screwed	297	254	2,087
Cast iron screwed	134	154	1,314
Pipe and fittings for:			
Cast iron pressure	5,770	1,712	13,284
Cast iron soil	687	940	6,519
Pipe, welded:			
Black steel	862	943	6,941
Black wrought-iron	401	196	1,812
Galvanized steel	1,016	1,109	7,975
Galv. wrought-iron	283	95	1,634
Pipe and fittings:			
Riveted iron or steel	.....	9	930
Wire:			
Plain iron or steel	1,230	2,527	14,224
Galvanized	1,153	3,140	14,954
Barbed	3,115	3,820	18,207
Woven wire fencing	144	234	1,329
Woven wire screen cloth:			
Insect	26	33	162
Other	80	60	730
Wire rope and cable	284	204	2,514
Wire strand	18	69	573
Card clothing	16	...	50
Other wire	363	539	3,735
Wire nails	1,654	2,264	11,985
Horseshoe nails	44	27	617
Tacks	13	20	135
Other nails, staples	325	555	2,675
Bolts, machine screws	565	643	5,344
Castings:			
Gray iron, semi-steel	298	339	2,356
Malleable iron	44	81	920
Steel, not alloy	111	65	900
Alloy incl. stainless	58	78	572
Car wheels, tires, axles	1,759	1,889	15,886
Horseshoes and calks	4	1	56
Forgings, n.e.s.:			
Not containing alloy	913	461	5,412
Alloy incl. stainless	10	9	256
Total	134,110	137,276	1,388,752
Scrap, iron and steel	106,883	125,399	2,017,654
Scrap, tin plate	764	359	7,166
Tin plate circles, strips, cobbles, etc.	144	329	3,261
Waste-waste tin plate	238	336	4,684
Total scrap	108,029	126,423	2,032,765
GRAND TOTAL	242,139	263,699	3,421,517
Iron Ore	121,703	142,282	333,366

*No distinction prior to 1938.

Machinery Exports Up 8 Per Cent in August

■ Exports of industrial machinery in August were valued at $22,067,799, an 8 per cent increase over $20,494,237 in August, 1937, according to the machinery division, department of commerce.

Smaller shipments were made in all major groups except power-driven metalworking machinery, in which exports were 106 per cent greater than a year ago. The largest decrease was 46 per cent, in textile, sewing and shoe machinery.

Power-driven metalworking machinery shipments in August were valued at $8,625,729, compared with $4,190,386 in August, 1937. Gains were made in almost all items of this group. Engine lathes increased 231 per cent; planers and shapers 468 per cent; surface grinders 298 per cent; and milling machines 337 per cent.

Construction and conveying machinery exports were 16 per cent below last year, mining, well and pumping machinery 8 per cent less, and power generating machinery 2 per cent lower.

Implement Exports Off 12 Per Cent Last Month

■ Exports of agricultural implements and machinery in August were valued at $6,654,583, compared with $7,533,005 in August, 1937—a decline of 12 per cent, according to the machinery division, department of commerce.

Exceptions to the decrease are noted in seed separators and harvesting machinery, in which gains of 171 and 23 per cent by value, respectively, were made. Harvesting machinery, strengthened by heavy shipments of combines, was valued at $1,105,104, compared with $896,556 in August, 1937. Seed separators were valued at $329,097, against $121,324 a year ago.

Shipments of tractors and parts in August were valued at $4,466,328, or 17 per cent below the figure for August, 1937, at $5,387,340.

Forecast Increase in Great Lakes Carloadings

■ Commodity committees of the Great Lakes Regional Advisory board, meeting in Buffalo last week, predicted freight carloadings in the Great Lakes region in the fourth quarter will be 7.3 per cent below the corresponding period of last year, but will exceed the current quarter.

The estimated loadings in the Buffalo-Cleveland-Detroit territory of 336,626 cars in the next three months are compared with 363,034 in the last quarter a year ago.

It is expected third quarter loadings this year will be about 26 per cent under the total for the same period in 1937.

■ Approximately 28 per cent of the nickel used in the United States goes to the automobile industry, being used in alloy steels and cast irons, in nickel plating and in thermostatic metals as well as nonferrous alloys. This statement was made by E. J. Hergenroether, International Nickel Co., speaking to the Syracuse Industrial club last Saturday.

Founders Plan Trade Promotion

■ SURVEY of the current business situation, merchandising, and specifications for steel castings occupied major attention at the fall meeting of the Steel Founders' Society of America in White Sulphur Springs, W. Va., Sept. 15-17. About 100 foundrymen attended.

The board of directors approved a list of occupational classifications recommended by a special committee and asked the committee to select from the 206 items on the extended list a small list upon which quarterly labor data may be exchanged. The board also approved the report of the advertising and trade promotion committee and appropriated $4000 for laying the groundwork for an industry advertising campaign for steel castings.

A standard address on steel castings, and film to illustrate it, were approved and will be available for general use of members of the industry shortly. The board reviewed phases of the current situation with respect to the study to be made by the national economic committee, and laid plans for handling factors affecting the steel castings industry. Plans also were made to deal with problems which may arise out of the wage-hour act.

Discusses Selling Methods

F. B. Ernst, American Steel Foundries, Chicago, spoke on constructive selling methods; S. Wells Utley, Detroit Steel Casting Co., Detroit, made an address on the state of the industry and some of the things which must be guarded against; and Col. M. G. Baker, executive vice president of the society, Cleveland, elaborated on various aspects of the national economic committee and the Walsh-Healey act.

General economic matters were dealt with by Dr. Neil Carothers, economist, Lehigh university, Bethlehem, Pa.

Chauncey Belknap, society counsel, discussed application of the wage-hour law, and R. L. Collier, secretary-treasurer, summarized the position of the steel castings industry and the society today.

C. W. Briggs, recently appointed technical advisor of the society, Cleveland, presented a technical paper on "Solidification of Steel for Castings and Modern Trends in Padding and Gating."

■ Sales of automatic coal burners in July exceeded those for the same month in 1937 by 19½ per cent, according to bureau of census data.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Sept. 24	Change	Same week 1937	Same week 1936
Pittsburgh ..	38	+ 2	73	74
Chicago	43.5	+ 2	79.5	73
Eastern Pa...	33	None	63	48.5
Youngstown..	48	+ 2	70	80
Wheeling	54	— 2	82	95
Cleveland ...	48.5	None	64	80.5
Buffalo	49	None	74	81
Birmingham..	57	None	83	64
New England.	60	None	75	88
Cincinnati ...	65	None	89	84
St. Louis.....	48.5	+ 6.5	74	†
Detroit	77	+10	100	95
Average....	48	+ 2	76	73

†Not reported.

PRODUCTION

■ STEELWORKS operations last week advanced in five centers and were unchanged in six, the national rate showing an increase of 2 points to 48 per cent. This is the highest rate since the final week of October, when it was 51 per cent.

St. Louis—Marked increase in orders raised the rate 6.5 points to 48.5 per cent.

Birmingham, Ala.—Unchanged at 57 per cent, with 13 open hearths in operation. Indications are for an increase soon.

Chicago—Up 2 points to 43.5 per cent, highest since first week of October.

Buffalo—Steady at 49 per cent for the third consecutive week.

Pittsburgh—Increases by smaller producers brought a rise of 2 points to 38 per cent. Better production at the week end indicates a higher rate this week.

Wheeling, W. Va.—Off 2 points to 54 per cent, resulting from small curtailment by one producer.

Central eastern seaboard — Unchanged at 33 per cent.

Cincinnati—Held at 65 per cent, the same level since mid-August, except for Labor day.

Youngstown, O. — Advanced 2 points to 48 per cent, as Republic Steel Corp. added a sixth open hearth. Active open hearths number 44, bessemers 2 and blast furnaces 10. Shenango Furnace Co. plans to add a blast furnace at Sharpsville, Pa., this week. Schedules for this week are the same as last.

Cleveland—Remained at 48.5 per cent, with a slight increase scheduled for this week.

Detroit—Up 10 points to 77 per cent, one producer operating virtually at capacity.

New England—Held at 60 per cent.

Chicago Made Sheet Mill Base

■ ANOTHER addition to the enlarged list of basing points in sale of steel products was made last week when Inland Steel Co. announced establishment of Chicago as a new base for sheets and tin mill products. Same f.o.b. prices are named there as at Gary, Ind., formerly the only base for Chicago district producers.

This move has practically no effect on delivered prices. Chicago steel consumers will continue to pay a switching charge of 60 cents a ton.

Establishment of the new basing point was made in the interest of uniformity and clarification, according to Inland. The question whether Inland would establish a basing point at Indiana Harbor, Ind., where the company rolls its open-hearth products, has arisen repeatedly in recent months. Pointing out that freight rates from Indiana Harbor offer no advantage over Chicago or Gary, former bases for most of the company's products, Inland stated that an Indiana Harbor base would be of no benefit to steel buyers or to the company.

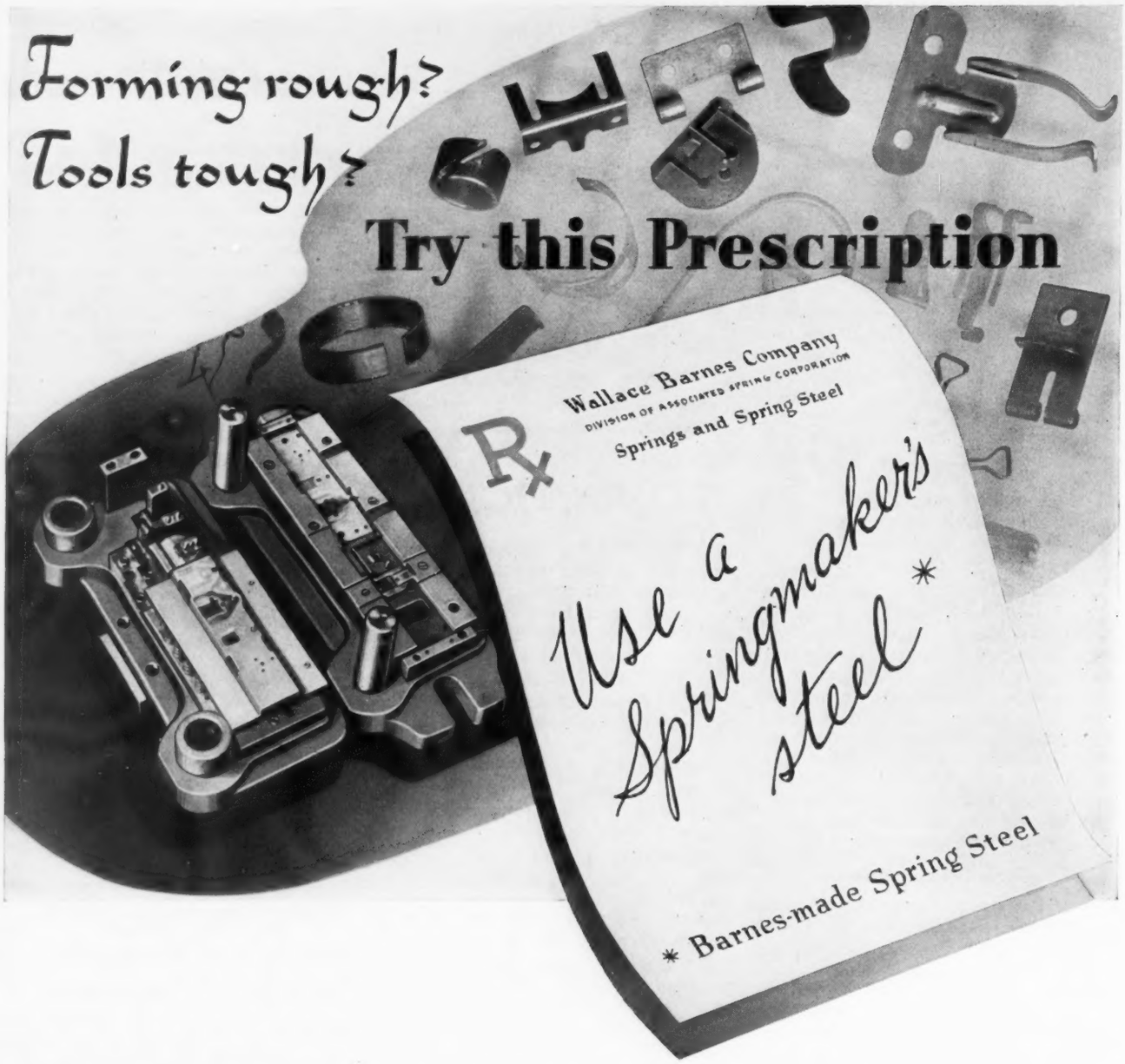
Since Indiana Harbor is in the Chicago switching district, consumers within the area would pay the same delivered price in the event a new base were to be set up at Indiana Harbor. Henceforth Inland will announce all of its prices, except on rails and joint bars, f.o.b. Chicago only.

Reinforcing Steel Group Fills Board Vacancies

■ Concrete Reinforcing Steel institute, conducting its semiannual meeting at French Lick Springs, Ind., Sept. 20-21, elected E. W. Langdon, manager, reinforcing department, Joseph T. Ryerson & Son Inc., Chicago, treasurer to succeed the late Hugh J. Baker, who was president, Hugh J. Baker Co., Indianapolis. J. R. Fenstermaker, new president of the Baker company, was elected a director of the institute until May 1 to complete Mr. Baker's term.

Business sessions of the meeting were devoted to discussions of marketing conditions. President Kenneth D. Mann, executive vice president, Truscon Steel Co., Youngstown, O., reviewed the institute's activities since the annual meeting in Hot Springs, Va., last April.

■ Jeffersonville, Ind., quartermaster depot has purchased 120,000 pounds of horse shoes from Phoenix Mfg. Co., Joliet, Ill., prices ranging from $7.42 to $8.92 per 100 pounds.



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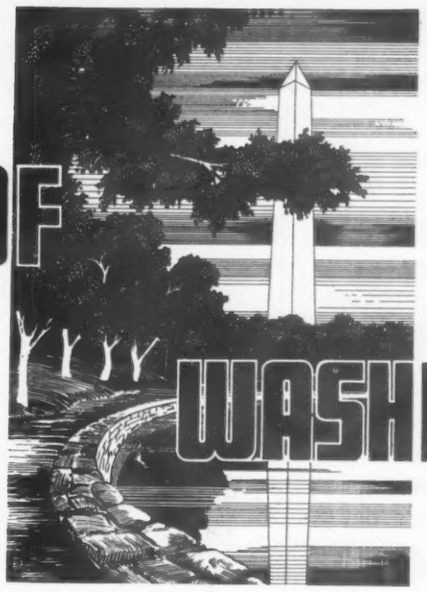


WASHINGTON

■ DESPITE assurances to industry by officials of the national economic committee, representatives of business who come to Washington frequently are still anxious about the actions of the committee in its monopoly investigation.

The latest cause for uneasiness is the fact that the committee, through the department of justice, has issued subpoenas against certain manufacturers, and refuses to divulge the names of the manufacturers or the extent of the subpoenas. This is a rather unusual procedure. It is quite understandable that the government would not discuss subpoenas before they are issued, but why it should maintain secrecy after they actually have been issued is a mystery.

Officials of the economic committee say they have recently received specific offers of co-operation from the National Association of Manufacturers and the United States chamber of commerce, and the American Bar association is understood to have expressed willingness to aid the committee in the study of patents.

Probers Deny "Goat Hunt"

Committee officials have expressed satisfaction at these offers and believe that leaders in the business world now feel the committee is not on a "goat hunting" expedition, but is making a sincere effort toward factual studies. They contend it is clear that if prosecutions were the purpose of the inquiry, the way to do that would be through a grand jury and not by legislative committee.

Much information is already in the hands of the committee, furnished by various governmental departments, and will be used at the public hearings. This is largely the sort of statistical material which business periodicals and advertising agencies, as well as other representatives of American business, have sought at various times from the government. The job of the committee, of course, will be to bring all of this information together so that there will be procured an accurate scientific picture of how the American economic system works. It is understood the committee considers this the primary essential to the preparation of any effective legislation.

BY L. M. LAMM
Washington Editor, STEEL

The statistical records of the department of labor and the bureau of the census of the department of commerce are being analyzed and co-ordinated with a view to bringing into bold relief the action of economic forces and practices. The bureau of labor statistics experts, it is understood, are going back 20 years and preparing price histories of steel and various other important commodities.

The bureau of foreign and domestic commerce of the department of commerce is mobilizing its informational resources, and by means of this study the public will be afforded opportunity of seeing just how rapidly the expanding economic system of the world works, in Europe as well as in America. Dr. Willard Thorp, a well-known economist, is devoting three days of his time to heading up the commerce department's part of the investigation for the committee. Under his direction, also, studies are proceeding in both the patent office and the bureau of the census.

Assistant Secretary of Commerce Patterson, who represents the department on the economic committee, announced late last week that the department would begin mailing out on Sept. 26, to approximately 2300 trade associations, questionnaires in connection with one of its monopoly surveys. He called attention to the fact that many data on trade associations and their activities are already in the hands of government agencies and will be utilized in this study.

Additional information may also be obtained from nongovernmental sources and through discussion with business men and trade association executives. The trade association study is being carried on by the marketing research division of the department of commerce under Dr. Thorp's direction.

TAX EXPERTS OPPOSE LARGER CORPORATE LEVY

A tax conference was held last week between Senator Harrison, chairman of the senate finance committee, and Representative Doughton, chairman of the ways and means committee of the house, with treasury experts who are working in a preliminary way on the tax program for the coming winter.

It is understood that considerable opposition has arisen among the experts over the suggestion of President Roosevelt to increase the corporate levy to the level of 1936. It will be recalled that the President tried to force this at the last session of congress, but neither the house nor senate would consent. It was reported at that time that the President fully intended to bring the matter up again at the next session of congress. The understanding here is that at present this tax is not included in the agenda on which the experts are working.

This program is unofficially said to include imposition of processing taxes on farm products; general increase in social security taxes; consideration of federal taxation of salaries of state and municipal officials; and federal taxation of state and

local securities; consideration of corporation taxes. The federal tax on corporation earnings expires Dec. 31, 1939, and it will, therefore, be necessary for the coming session of congress to take action.

ANDREWS PLANS EARLY WAGE-HOUR ANNOUNCEMENT

Elmer F. Andrews of the hours and wages division still hopes that he will be able to make public before Oct. 23, when the new act becomes effective, definite indications of the fields of business and kinds of occupations that may be held subject to the new law.

As pointed out previously, Mr. Andrews has been somewhat handicapped by the slowness with which the United States civil service commission is certifying employes for his division. This has meant that thousands of letters from trade associations and individual industrial firms have not been answered. In this connection, the administrator several times has indicated at press conferences he hopes to get out a general statement before Oct. 1, which will answer a great many of these inquiries.

An interesting situation developed when announcement was made of the textile industry committee when someone in Mr. Andrews' office inadvertently mentioned the fact that on the committee representing the public there was only one man whose name does not appear in "Who's Who." This was said to just be a coincidence, and assurance has been given that it is not necessary to have your name in that volume in order to become a member of the committee representing the public.

Proceeding Slowly

A story is being passed around that consideration of the selection of industry committees other than those for textiles and tobacco will be deferred for some weeks. It is reported that Mr. Andrews wants to get the problems of these industries ironed out before he takes on any additional committees.

As previously stated Administrator Andrews is anxious for an interpretation of what constitutes interstate commerce under the wage and hour law. He has indicated a number of times at his press conferences that this would be one of the early duties of his general counsel. Calvert McGruder, the recently appointed new general counsel for Mr. Andrews, last week admitted that he has this important matter under consideration and stated that it might take some time to form a definition. He pointed out, however, that when he does reach a decision it will merely represent his own definition and will, of course, have no official status under the law. He stated that an official definition is really the function of the courts, and he seemed to be a little put out that Mr. Andrews has so often promised an interpretation of what interstate commerce meant under the new hours and wages act. Any interpretation that he might make, Mr. McGruder said, would not be binding in any way, and he explained what he hopes to achieve is merely an idea that can be used by the hours and wages administration as a basis under which to do future work.

At a press conference last week, Mr. Andrews expressed hope that as his personnel expands he will be able to appoint an economist to have charge of specific industries. He said, for instance, that he hoped to have an economist appointed for the steel industry as he would for the many other basic industries of the country. Even if a wage question was not up at the time, this economist could be laying the ground-work for future negotiations.

Resigns as Head of Metals, Minerals Division

Ralph L. Harding

■ Ralph L. Harding, chief of the metals and minerals division, department of commerce, since August 1934, has resigned, effective Oct. 1, to re-enter private practice. He will become associated with Wilbur Watson & Associates, Cleveland, with whom he was connected before entering government service.

A graduate of Case School of Applied Science in 1905, Mr. Harding became engineer in charge of construction for the Grasselli Chemical Co., Grasselli, N. J. Later he went to the Philippines as district engineer and engineer in charge of the Manila Railroad Co. After serving in the World war, he joined Wilbur Watson & Associates.

Mr. Harding succeeded Luther Becker who was chief of the old iron and steel division.

BRITISH TRADE PACT MAY FAIL TO GO THROUGH

There is renewed talk that the trade agreement between the United States and England is about to fall through. There have been rumors off and on to this effect for some weeks, but no one has taken them seriously.

While Secretary of State Hull will not discuss the matter, some government officials feel it would be far better to have no agreement than to negotiate one out of which the American government can get nothing, which seems to be the present situation.

SWEDISH INDUSTRIAL RELATIONS REPORT ISSUED

President Roosevelt has made public the unanimous report of his committee on industrial relations in Sweden. It parallels the statement on industrial relations in Great Britain made public some weeks ago. Although differences in practice between the two countries are apparent in the report the striking fact is similarity of approach and the widespread satisfaction with the procedures adopted. In Sweden, as in Great Britain, employers generally have accepted a program of collective bargaining; there is extensive independent organization of both groups and all concerned live up to the rules in participating in collective bargaining.

GOVERNMENT BUYS MUCH IRON, STEEL, MACHINERY

The labor department has issued a statement that since the Walsh-Healey act went into effect 9950 contracts have been entered into by the government, valued at approximately half a billion dollars.

Secretary of Labor Perkins, under whom the division of public contracts operates, has approved 18 minimum wage recommendations made by the board under the act and 16 dates have been reserved on the board's calendar for hearings to be held this month or next.

Data made public by the division show that from Sept. 28, 1936, to Sept. 1, this year, 982 contracts have been entered into by the government under the Walsh-Healey act for iron, steel and their products, valued at $50,725,000, which is 9.15 per cent of the total value of contracts entered into during that period. Also, 863 contracts have been made for machinery totaling more than $37,000,000, or 6.69 per cent.

Co-operate with Monopoly Inquiry, Trade Association Executives Urged

■ SUBSTANTIAL amendments to the national labor relations act are necessary to achieve the balance between employers and employes which is the essential feature of labor relations in Great Britain. This was a conclusion of John C. Gall, counsel, National Association of Manufacturers, addressing the nineteenth annual convention of American Trade Association Executives in Pittsburgh last week.

Essential principle in British practice, as revealed by Presidential commission's report, is that both employer and employe should be as free as possible to work out their own problems, said Mr. Gall. The government intervenes only to the extent of protecting the public against practices which would be directly harmful to it.

Discussing the new federal wages and hours law, Mr. Gall said: "It is obvious that there are many possible complications and difficulties. Many of these can be overcome by careful and moderate administration, and it is proper to say on this point that the new administrator should be commended for the spirit evidenced at the outset. He has indicated that this is not a task to be accomplished overnight; that he is more concerned with getting the right answers than with getting quick ones; that he is cognizant of many of the problems of industry and sincerely desirous of making the act work without maladjustments, and without imposing undue hardships on those to whom it may be applied."

Mr. Gall called attention to the many perplexing problems yet to be solved and the many provisions yet to be interpreted.

Predicts Better Understanding

Co-operation with the national economic committee's investigation of trade association activities was urged in the presidential address of North Storms, secretary-treasurer, National Glass Distributors' association, Chicago.

"There seems to be a sound basis for the feeling that out of this investigation will come a better understanding of the functions of trade associations, not only on the part of the general public, but on the part of legislative and administrative bodies of government whose work has not brought them into adequately close touch with the public service characteristics of trade associations," he said.

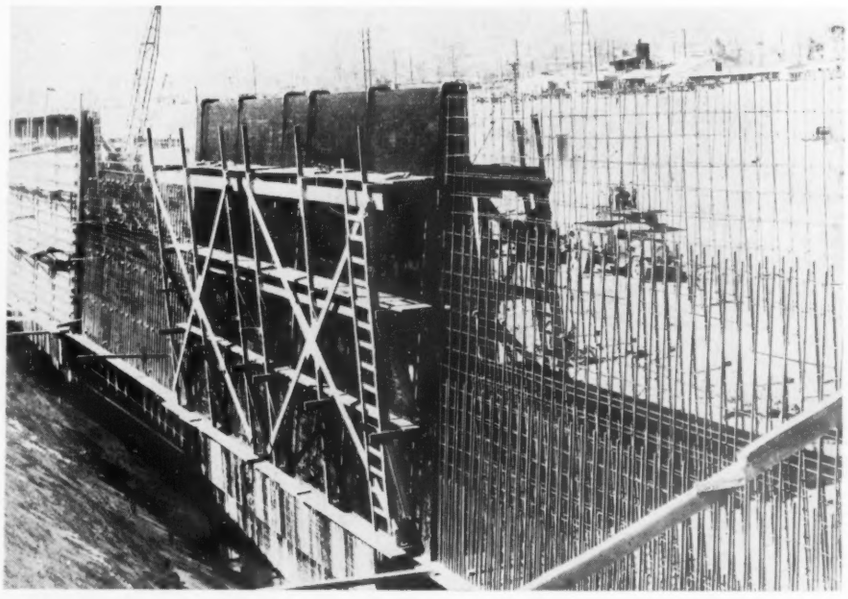
Technical and engineering research by the associations was mentioned as one of the public services.

"Industry necessarily will approach this inquiry with mixed feelings," declared Edwin B. George, economist, Dun & Bradstreet Inc., New York. "As groups of human beings they will wish both to assist the government in correcting maladjustments and protecting themselves against unfair attacks . . .

"One of the best things they can do is to use the last ounce of power or influence they may have to see to it that this investigation is long enough and thorough enough. The greatest danger of all, especially in view of the fact government files are already crowded with evidence of technical wrong-doing, lies in a brief and superficial inquiry. Such an inquiry would be most likely to result in a vindication of preconceived ideas."

John W. Hill, public relations counsel, American Iron and Steel institute, explained the public relations activities carried on by the steel industry, emphasized the need for all industry to keep the public informed as to the services rendered by industry.

Steel Plays Vital Part in Flood Control



■ **United States engineers are engaged in a vast flood-prevention project along the Los Angeles river, to forestall a recurrence of last year's damage. Hundreds of tons of reinforcing steel are being used in construction of channel walls**

Bridgeport Brass Builds New Rolling Mill Plant

■ Straight-line production principle will be employed in the new rolling mill just completed by Bridgeport Brass Co., Bridgeport, Conn. First major step in the company's expansion and modernization program started early last year, the plant cost $4,500,000, has 200,000 square feet of floor area, required 1375 tons structural steel.

Estimated monthly capacity is 3000 tons of brass, copper and copper-base alloys. In addition to the new manufacturing plant, a new mill office and laboratory building, housing all research, development and testing facilities, has been completed.

Orders for Foundry Equipment Up in August

■ Foundry equipment orders increased moderately in August—the net orders' index 83.3, comparing with 74.2 in July and 257.5 in August, 1937, according to the Foundry Equipment Manufacturers' association. Shipments declined, the index for July standing at 89.1, compared with 105.8 in July, and 266.6 in August, 1937.

Unfilled orders' index for August was 102.8, against 108.6 in July and 351.1 in August, 1937. Three months' average of gross orders was 73.6, compared with 76 in July and 229.9 in August last year. Indexes are based on 1922-24 as 100 per cent.

$ MILLIONS

FOR YOUR PROTECTION

Behind the TIMKEN Alloy Steel recommended for your product is an investment of millions of dollars in specialized technical knowledge, research, manufacturing and testing.

When you submit your steel problems to this organization for example, you obtain—without charge or obligation—the services of a group of alloy steel technicians whose combined knowledge, versatility and experience is unsurpassed.

No individual steel user could afford to hire these men, yet the full benefit of their expert advice is free to every user and prospective user of TIMKEN Alloy Steels, and TIMKEN Carbon and Alloy Seamless Tubing.

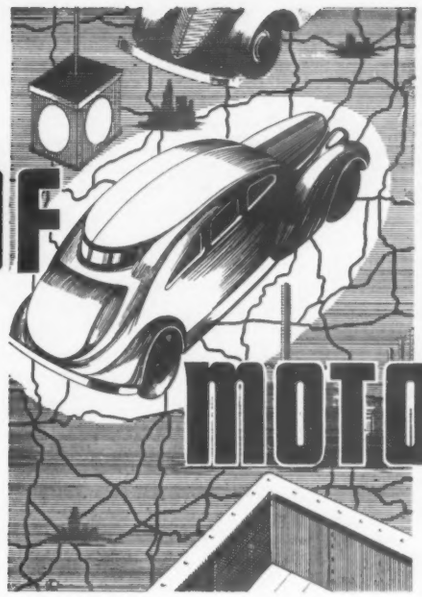
It's the same in every other department, where experienced steel makers, rollers and inspectors aided by the most modern equipment are constantly working hand-in-hand to assure the steel user's satisfaction and protection.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO
Steel and Tube Division

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; TIMKEN Rock Bits; and TIMKEN Fuel Injection Equipment.

TIMKEN
ALLOY STEELS

MIRRORS OF MOTORDOM



DETROIT

■ OUTRANKING any other consideration of new car models, from the standpoint of external appearance at least, is the striking similarity which runs through all makes, with the exception of Packard which has revised outward lines only in minor degree. Design themes introduced by Graham and Lincoln Zephyr have spread in one form or another across the entire industry and in 1939 the style pioneers will be few if any.

Explanations as to why various designers have universally veered toward the same channel are numerous, one being that the new styles represent a maturing of design thought. Obviously there is no particular reason why designers, appraised of the public's favor toward certain lines, should not work in this direction. The result is a lessening of competitive appeal on the score of appearance, but there are many other factors which sell cars besides their looks.

Radical Design Doesn't Pay

If the trend developing in the new models is one which can be expected to endure, then American automobiles can be counted on to progress as an industry unit, and the forays of individual makers into new design fields will be fewer.

The large producers have recognized the danger and high cost of venturing into new style ideas, preferring to wait until the public has accepted a trend rather than to spend millions for dies and production tools for a radical design and then find it too far advanced for profitable sales.

One of the Graham brothers, speaking here recently on design trends, gave as his belief that the so-called independent producers must keep a step ahead of the rest of the industry if they are to stay in business. Graham, of course, did this with its 1938 models, but it remains to be proved whether or not this policy can be translated into a profit. Graham probably still is at least a half-step ahead of the rest of the industry from a design angle; the next 12 months will supply the answer to the merchandising question.

BY A. H. ALLEN
Detroit Editor, STEEL

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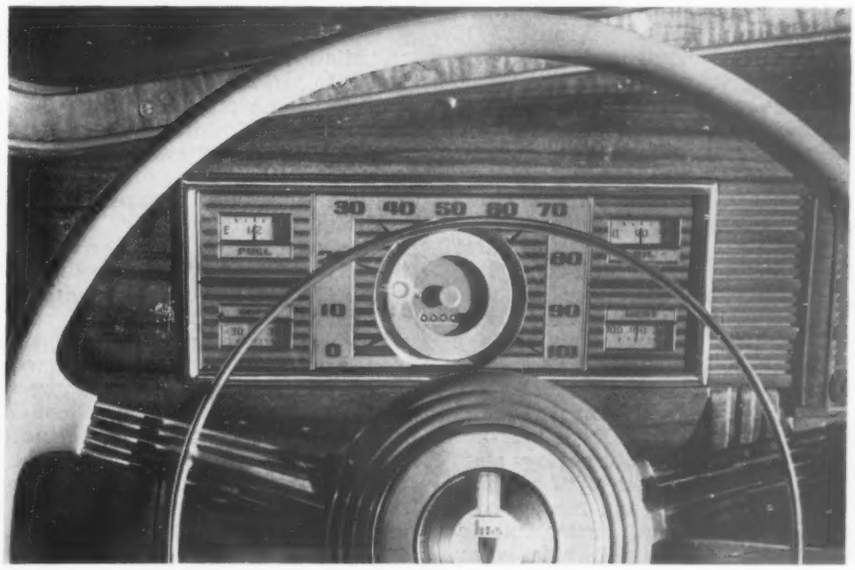
It is no criticism of the automotive industry to say that new models all trend toward a similarity in design. It is only a matter of good business that they have been so designed.

■ NEW features in transmissions include the predominant swing to gearshift levers mounted on steering columns and the adaptation of the overdrive or some variation of it. De Soto is offering, at moderate extra cost, an improved overdrive transmission which gives the equivalent of five speeds forward. It becomes effective at a speed of 25 miles per hour, where formerly it was usable only at speeds in excess of

Illuminated Eye Indicates Automobile Speed



■ **Closeup of new "safety signal" speedometer developed by Chrysler engineers and used on all 1939 models in the Chrysler Corp. line. An illuminated eye on the speedometer needle shows green from 0 to 30 miles per hour; amber from 30 to 50; and red thereafter. Manufacture is divided between Stewart-Warner and the Moto-Meter division of Electric Auto-Lite**

35 miles per hour. A second new feature is the so-called "step-down" which permits the driver to shift instantly from overdrive back to the next lower gear by merely stepping down on the accelerator. When the need for quick acceleration has passed, the driver may shift back automatically to overdrive by releasing pressure on the accelerator for an instant.

Packard also is offering an "econodrive" transmission on three of its new models, which is much similar to the one just described. It cuts in at 30 miles per hour and is estimated to bring a 20 per cent saving in gasoline consumption.

A spectacular show was run off at the Packard proving ground in connection with the preview of new models by newspaper men and 3000 distributors and dealers Monday. At the 500-acre test grounds near Utica, Mich., they saw cars thunder across a road of railroad ties, leap 30 feet from the end of an incline while traveling at 60 miles per hour, and come unscathed through other tortures. In one test rigidity was demonstrated by removing one front wheel from a car and driving it across a deep ditch without the exposed hub touching the ground. Company officials put stock cars through speed tests around a 2½-mile track.

Outwardly the new Packards have probably fewer changes than any other 1939 model, probably because the company has always placed much emphasis upon the standard Packard lines, and with considerable success. Currently Packard is running about 1500 new models per week off assembly lines.

■ PONTIAC is claiming improved riding qualities from its "duflex" rear springing arrangement which cuts spring oscillation rate to 72 per cent under full load and 76 under no load, compared with 86-96 for conventional springing. Low oscillation rate and low spread bring the rear spring rate almost the same as the front spring rate, and permit finer adjustment of shock absorbers.

These new springs mark the first application of variable-rate leaf springs to the passenger car field (they have been used on buses), and Pontiac will enjoy this advantage for a year, but others contemplate using them in 1940 models. The conventional leaf spring has a deflection rate of about 130 pounds per inch. The new Pontiac springs start at 95 pounds per inch with one passenger in the car and range up to 155 pounds per inch under full deflection. The variable rate is accomplished by making the lower three leaves of the eight-leaf spring with a reverse curvature, so that the taper-finish ends of these three leaves fan away from the spring itself. As pressure on the spring is gradually increased, contact is made with the top faces of these three leaves with the result the deflection rate is increased progressively.

Objection to the variable-rate spring has been the added cost involved because of the heavier sections required. About 5 per cent more steel is required in the variable-rate spring leaves, one reason being that the initial load is carried by only five of the eight leaves.

However, with the development of a parabolic section for spring leaves, it was possible to effect a 7 per cent reduction in the amount of steel used, to obtain comparable performance. The result has been that now the variable-rate spring can be made with a net 2 per cent saving in steel—welcome news to engineering and purchasing departments.

The parabolic section, as opposed to the conventional rectangular section, is an outgrowth of research which showed the compression side of a spring leaf to withstand considerably more stress than the tension side. Hence it was reasoned that by tapering off the compression side a saving in material could be achieved without any sacrifice of strength. Thus the edges on the lower or compression side of these new leaves are, in effect, beveled off appreciably.

No change is made in the shackling of the new Pontiac springs and in view of the fact spring covers are used, the average person will detect no difference in the appearance of the springs. But the company should cash in handsomely from the advertising advantages such a new development offers; and those who have had experience with the variable-rate springs say they bring a definite improvement in riding qualities, especially in sedans.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
April	527,625	553,231	238,133
May	480,518	540,377	210,183
June	469,368	521,153	189,399
July	451,206	456,909	150,444
7 mos.	3,045,714	3,373,778	1,456,476
Aug.	275,934	405,072	*85,000
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Estimated by *Ward's Reports.*

Week ended	
Aug. 27	18,700
Sept. 3	22,165
Sept. 10	17,485
Sept. 17	16,100
Sept. 24	20,390

	Week ended Sept. 24	Sept. 17
General Motors	5,895	4,675
Chrysler	7,170	5,950
Ford	1,600	515
All others	5,725	4,960

■ FROM experimental work now going forward at the Ford plant, it is deduced the use of hardened steel liners may be a contemplated move. Although it is definitely stated such liners are not being used at present in production engines, it is admitted a number of experimental engines are being so equipped.

Behind this development lies an interesting story of an engineering program designed to overcome cylinder bore wear.

This problem is not peculiar to Ford, for, as pointed out here previously, several companies are concertedly attacking the matter of producing an engine block which will have satisfactory bore hardness and still be machinable on panrails and manifold faces.

Last year Ford was experimenting with a "hot spot" head, an aluminum cylinder head with no water jackets which was designed to give hotter combustion and improved economy. One version of the function of this head went to the effect that it promoted hotter combustion and in addition speeded up the expulsion of exhaust gases, with their moisture content, from the cylinder, thus preventing any water from acting to dilute crankcase oil.

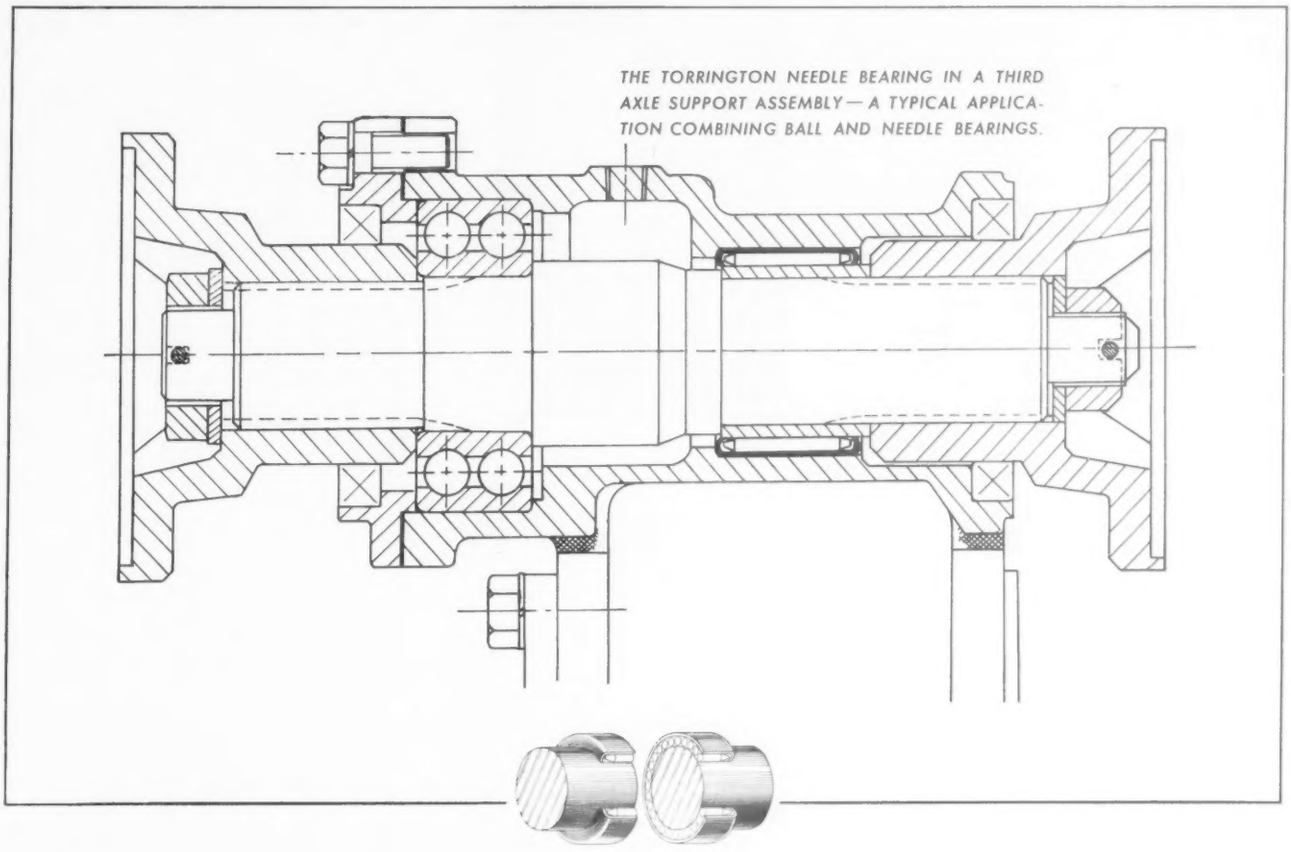
In the meantime the research took a different tack and a matter of liners or sleeves came up for consideration. Such liners were being used successfully on taxicab and commercial car engines, so it was only natural that their extension to other engines would be studied. Now it is understood Ford engineers are about convinced of the practicality of inserting a hardened steel liner in each cylinder, which would provide a surface with better wearing qualities and at the same time obviate the need of changing the head design.

The liners, or dry sleeves, would simply be fitted into the bored cylinders and the expansion under engine heat would insure a tight fit.

■ AFTER a three-day flareup at the Briggs plant, the labor situation has quieted again, but all plants have their fingers crossed for the time being. Publicly the UAW appears to have healed the rupture in its ranks. At present the union is attempting to consolidate its position and take steps to build up its treasury which has been badly depleted in recent months. But the suddenness with which the Briggs trouble developed gives scant hope that UAW members are any more seriously concerned with living up to their contracts with employers.

TORRINGTON NEEDLE BEARING

DESIGN AND SERVICE FEATURES



THE TORRINGTON NEEDLE BEARING IN A THIRD AXLE SUPPORT ASSEMBLY—A TYPICAL APPLICATION COMBINING BALL AND NEEDLE BEARINGS.

BEARING CONSTRUCTION ASSURES AMPLE LUBRICATION

Lowers Maintenance, Increases Life

THE CONSTRUCTION of the new Torrington Needle Bearing assures ample, constant lubrication, contributing materially to the life of the bearing and reducing the need for service attention. The hardened retaining shell which holds the needles in a single compact unit serves also as a reservoir for a large quantity of oil or grease, keeping the shaft, which serves as the inner race, constantly floating on a lubricating film. This is particularly important in heavy-duty applications like the support assembly for the third axle, shown in the illustration—an interesting example of the combination of ball and needle bearings in a single mechanism.

High radial load capacity, obtained by the bearing's many linear inches of contact, enables the bearing to withstand severe loads in either rotating or oscillating applications.

Low Unit Cost

The Needle Bearing is low in unit cost, and its use permits marked economies in housing design and in installation expense, making it possible to obtain full anti-friction construction at a cost comparable to that of simple bushings. It is readily pressed into place, and requires only the simplest type of housing structure.

The Torrington Engineering Department will cooperate in the laying out of bearing applications utilizing the advantages of this unusual bearing in your products. Further information is given in the Torrington Needle Bearing Catalog, available on request. Write for Catalog No. 10. Specifications on Torrington Ball Bearings may be obtained by requesting Catalog No. 401.

The Torrington Company
ESTABLISHED 1866
Torrington, Conn., U.S.A.
Makers of Ball and Needle Bearings
Branch Offices in all Principal Cities

TORRINGTON
NEEDLE BEARING

MEN OF INDUSTRY

■ O. M. GIBSON, former metallurgist, Dodge Bros. Corp., has been appointed research director, G. S. Rogers & Co., Chicago. All production-control and research laboratories of the company's Middle West and eastern seaboard plants will be under Mr. Gibson's supervision. A graduate of the University of Detroit, Mr. Gibson, was formerly field metallurgical engineer for J. B. Ford Co., and later manager, metalworking research department, E. F. Houghton & Co., Philadelphia.

♦

L. S. Mills has been appointed representative in Johannesburg, South Africa, for Edgar Allen & Co. Ltd., London.

♦

William C. Buell Jr. will sail Sept. 28 in the interest of Arthur G. McKee & Co., Cleveland, to make an economic study for a long-term development program for an English firm.

♦

Arthur Roeder, president, Colorado Fuel & Iron Corp., has been elected a director, Alpha Portland Cement Co., to fill the vacancy caused by the death of J. H. Lockhart, of Pittsburgh.

♦

C. S. Quillen has been placed in charge of field engineering, Mixing Equipment Co., Rochester, N. Y., covering New York city, and central southern territories of the state. A graduate of Drexel institute, Mr. Quillen was formerly with Alco Products Inc. and Carbide & Carbon Chemical Corp. He will have headquarters at 377 Broadway, New York.

♦

John H. Abbott has been appointed manager of alloy sales for Rotary Electric Steel Co., Detroit. He has been associated with Timken Steel & Tube Co. for the past eight years, handling alloy steel sales in the Detroit area.

James M. Johnson, associated with Rotary Electric Steel the past four years, has been named manager of carbon steel sales, including cold drawn and hot-rolled carbon bars and cold-rolled strip steel.

♦

Jack Anthony Nachowitz, mechanical engineering graduate of the University of Illinois, and Sidney J. Brooks, graduate of the ceramic engineering department, Ohio State university, have been appointed to research fellowships in the graduate school, Ohio State university, by Battelle Memorial institute, Columbus, O. Mr. Nachowitz will study coloration possibilities of metals and

O. M. Gibson

alloys, and Mr. Brooks will investigate effects of vitrifying agents on physical properties of wall tile bodies.

Julian Glasser has joined the institute staff to engage in chemical and electrochemical research in metallurgy. He studied at University of Illinois and California Institute of Technology, obtaining his doctor's degree at Pennsylvania State college. Ellsworth McSweeney has been made research associate at the institute and will study organic tin compounds. He graduated from Oberlin college in 1934 and received a Ph. D. degree from the University of Rochester this year. He is a member of the American Chemical society.

♦

Adolph Bregman, metallurgical engineer, since 1919 managing editor of *Metal Industry*, has severed his connection with that journal, effective Oct. 1, and established an office at 123 William street, New York, as a consultant in the metal products manufacturing and metal finishing industries. Mr. Bregman is executive secretary, Masters' Electro-Plating association, and a member, American Society for Testing Materials, and Institute of Metals division, A. I. M. E.

Adolph Bregman

♦

Avery Phillis has been named district manager at Chicago for Beaver Pipe Tools Inc., Warren, O. He succeeds W. S. Andrews, who has resigned to join the Equitable Meter Co., Pittsburgh.

♦

Fred Grotts, heretofore vice president and metallurgical director, Lebanon Steel Foundry Co., Lebanon, Pa., has become associated with the Chicago Steel Foundry Co., Chicago, as vice president in charge of heat and corrosion resisting alloys. Previous to joining the Lebanon organization in March, 1937, he was for seven years associated with the Continental Roll & Steel Foundry Co., Pittsburgh.

♦

B. B. Root has been elected vice president and general manager, Bridgeport Machine Co., Wichita, Kans. The past five years he has been in charge of the company's legal department. L. A. Babb, sales manager, and associated with the company over 20 years, has been advanced to vice president and general sales manager. F. K. Blauvelt, who joined the firm 12 years ago and has been in charge of the manufacturing department the past 10 years, has been promoted to vice president and plant superintendent.

♦

Herman R. Larson has been appointed central district service manager, Westinghouse Electric & Mfg. Co., with headquarters at the Homewood works, Pittsburgh. Before joining Westinghouse in 1919 he was associated with the Tacoma Railway & Power Co. and the Puget Sound Electric Railway Co. With the exception of one year, 1920, when he was located in the generator test division, Mr. Larson has been continuously in the service department. The past two years he had been assigned to executive duties in the headquarters service office.

DIED:

■ WILLIAM A. SCHENDEL, 53, founder and president, Atlas Metal Parts Co., and from 1908 to 1936 assistant purchasing agent, A. O. Smith Corp., Milwaukee, in Milwaukee, Sept. 16.

♦

Joseph Wolf, 65, one of the founders of Wolf & Co., Hamilton, O.,

dealer in scrap metals, in Cincinnati, Sept. 16.

♦

Irving G. Huddilston Sr., 57, in Cleveland. He formerly was traffic manager for Upson-Walton Co., associated with the company since 1918.

♦

Eugene Haslett Darrach, 72, in Indianapolis. He was a founder and for several years president of the Interstate Car Co., Indianapolis, manufacturer of railroad castings.

♦

Col. Charles Arthur Carlisle, 74, in Indianapolis. He was a director of South Bend Malleable Iron Co., South Bend, Ind., and a former president of the National Association of Manufacturers.

♦

Williams Robb Barclay, 62, in Birmingham, England, Sept. 16. An authority on nonferrous metallurgy, Mr. Barclay was best known for his contribution to the development of the nickel industry.

♦

Norman W. Sherow, 80, Sept. 16 at his home in Mahwah, N. J. He was an executive of the former A. B. See Elevator Co. Inc., Jersey City, N. J., and was a director of the company at the time it was sold to Westinghouse Electric & Mfg. Co. in 1937.

♦

C. H. Rohrbach, 62, Sept. 7, in Rochester, Pa. He was secretary and director of several trade associations, among them the Hydraulic Institute, Special Refractories association, and Pump Manufacturers association. His offices were at 90 West street, New York; his home in Summit, N. J.

♦

Sir Nowroji Saklatvala, 63, at Aix-les-Bains, France, July 21, of heart failure. He was on a vacation trip to Europe and America. A nephew of the late Jamshedji N. Tata, founder of Tata Iron & Steel Co., Jamshedpur, India, he was associated with the latter's two sons in the development of the iron and steel industries centered at Jamshedpur. He became chairman of Tata Sons Inc. and Tata Iron & Steel Co. Ltd., on the death of Sir Dorabji Tata, one of the sons, in 1932. He introduced the profit-sharing plan of the Tata company, first of its kind in India. He was knighted in 1933 and was also a Companion of the Indian Empire and Knight of the British Empire.

B. D. Saklatwalla, partner in Saklatwalla & Foote, New York, metallurgists, formerly vice president of Vanadium Corp. of America, is a cousin of Sir Nowroji, their mothers being sisters of Mr. Tata. The two boys were brought up together as children in Bombay.

Super-Road Through Alleghenies; 41 Bridges, 9 Tunnels; 33,777 Tons Steel

■ OFFICIAL estimates place at 33,777 tons the amount of steel that will be required for the 4-lane, 162-mile toll highway through the Allegheny mountains, connecting Pittsburgh and Harrisburg.

Forty-one bridges will be constructed—25 over streams and the others at intersecting roads. Nine tunnels will pierce the mountains for a total distance of seven miles and will eliminate the most serious hazards. Maximum grade of the highway will be only 3 per cent; maximum elevation, 2000 feet. The estimates:

	Tons
Reinforcing steel for roadways and tunnels	22,094
Reinforcing steel for concrete pipe	75
Total reinforcing steel	22,169
Structural steel for roadways	8,608
Structural steel for tunnels	3,000
Total structural steel	11,608

Estimated cost is $58,000,000, to be financed through the PWA and the RFC, the project having been approved.

No intersection at grade will be made throughout the 162 miles. Fast and slow lanes will be provided with east and west traffic divided by 10-foot parked areas.

Pioneers Failed

Every foot of the turnpike will be new road, built on a winding 200-foot right-of-way. Actual roadways will be 24 feet wide in addition to 10-foot shoulders and the 10-foot parked area in the center. Highway will narrow down from four to three lanes at the tunnel entrances and then to two lanes in the tunnels themselves. Tunnels will have 14 feet vertical clearance, and protected walks 2½ feet wide on each side.

Pioneer railroaders started the tunnels through the mountains and had dug or blasted through 22,305 feet of hard rock before their project was abandoned in 1881. These tunnels will be widened and worked into the new highway.

At points where the highway will cross under or over others, cloverleaf entrance and exit ways will be constructed. For further safety, curves will be unusually wide, warning signs will be larger than customary and special police will regulate traffic. Tunnels will be lighted day and night.

Freight will yield the chief income, according to the planners. Engineers estimate that between Harrisburg and Pittsburgh, heavy trucks will save two to six hours and $12 to $27 in fuel costs and equipment wear. With an average toll of $6 for large trucks, it is estimated heavy vehicles will pay more than $1,000,000 the first year.

An average passenger car toll will be $1.25, and by the tenth year a gross of $4,832,000 in annual tolls is anticipated.

Considerable structural and reinforcing steel also will be required for a $27,000,000 super-highway to relieve traffic congestion in Pittsburgh, which secured federal approval last week. A four-lane roadway will carry traffic through the city by means of tunnels and elevated roads. One-half the cost will be paid by the government, the remainder by state, city and county.

Sales for Recovery—Retail Campaign Slogan

■ Advertising and promotion campaigns to stimulate retail sales last week were under way in more than 100 communities. Primarily a retailers' program, success offered obvious benefits to manufacturers, especially those of consumer goods.

Many cities linked their sales crusades with the "national retail demonstration" week sponsored by retail associations. Although the campaign varied from city to city, generally stressed was the increase in employment that would result from increased trade. Typical slogans: "Spend that men may work" and "More sales—more jobs."

Market surveys in many cities indicated a considerable volume of consumer goods sales will be made in the last quarter of 1938.

Steel Barrel Makers' Census Shows Gains

■ Manufacturers of steel barrels, kegs and drums in the United States reported a slight increase in employment and a considerable increase in wages and value of products for 1937, compared with 1935, according to returns of the biennial census of manufacturers.

Wage earners in 1937 numbered 6231, an increase of 8.2 per cent over 5761 in 1935. Their wages, $7,356,641, exceeded the 1935 total of $5,839,272, by 26 per cent. Value of products for 1937, at $47,843,465, gained 38.1 per cent over the 1935 total, $34,649,993.

Activities of Steel Users, Makers

■ TIFFIN Art Metal Co., Tiffin, O., manufacturer of sheet metal products since 1903, has been reorganized, and expansion plans are under way, including construction of an additional building. William G. Purdy, president and general manager, was re-elected. John P. Speck and J. Hadsell Baum were added to the organization as vice president and secretary-treasurer, respectively. Refinancing consists of $125,000 in first mortgage 4½ per cent bonds and issuance of 18,500 shares of common stock.

♦

Jones & Laughlin Steel Corp. has enlarged its offices in the Broad Street Station building, Philadelphia, where it has been located for a number of years.

♦

Slome Belting Co., 2036 East Twenty-second street, Cleveland, has been appointed distributor in Cleveland and surrounding territory for Johnson Belting Co., 34 Hubert street, New York.

♦

Kerchner-Marshall Co., Pittsburgh and Cleveland, seller of pig iron, coke and foundry specialties, has opened an office in Detroit in charge of Don E. Perkins, metallurgist.

♦

R. G. Haskins Co., Chicago, manufacturer of flexible shaft equipment, high speed tapping machines, capping equipment and power screw drivers, has moved to larger quarters at 615 South California avenue.

♦

Trico Fuse Mfg. Co., Milwaukee, has appointed Marine Specialty & Mill Supply Co., 201 Julia street, New Orleans, distributor for Louisiana and southern Mississippi for fuses and accessories.

♦

Ferracute Machine Co., Bridgeton, N. J., has appointed Giebel Machine Co. Inc., 236 West Fifty-fifth street, New York, its representative. It will handle the entire line of power presses for stamping, shearing, punching, coining and embossing.

♦

Continental Machine Specialties, Minneapolis, has opened an office and display room at 119 Lafayette street, New York, in charge of D. A. Moreinis, operating as the Doall Eastern Machine Co. Under his direction are J. M. Dillon in New England territory, L. A. Peirez, New York city territory, and M. A. Singer, Philadelphia.

♦

Straight Line Engine Co. Inc. and the Direct Separator Co. Inc., Syracuse, N. Y., have been merged to form the Straight Line Foundry & Machine Corp. The business of each will be continued as before under the Straight Line division and the Direct Separator division, respectively, of the new corporation. Headquarters are at 218 South Geddes street, Syracuse.

♦

General Cable Corp., 420 Lexington avenue, New York, has been awarded a contract by the bureau of power and light, Los Angeles, for the third transmission line from Boulder dam to Los Angeles. This will require more than 6,000,000 pounds of copper. The line will be the same as the original installation, hollow copper conductor, 1.4 inches in diameter, to be operated at 287,000 volts.

♦

M. D. Friedman Co., Ashland, Ky., dealer in steel and iron scrap, has elected H. D. Stalnaker, Pittsburgh, vice president. Offices for the Friedman company will be opened at 1030 Grant building, Pittsburgh. J. H. Stalnaker will be assistant. H. D. Stalnaker has been engaged in the scrap business in the Pittsburgh district for many years, operating since 1937 as Stalnaker Steel Co.

♦

Two new stocks of Nichrome and other D-H electrical alloys on the Pacific coast are announced by the Driver-Harris Co., Harrison, N. J. These products are now available in southern California through the Electrical Specialty Co. of Southern California, 449-451 South Pedro street, Los Angeles, and in the northwest territory by Electrical Specialty Co., 714 Fourth avenue, Seattle. These two new sales outlets are in addition to the Electrical Specialty Co. Inc., 316 Eleventh street, San Francisco, established several months ago.

♦

Robert M. Irving, formerly treasurer, general manager and sales manager, Hammond & Irving Co., Auburn, N. Y., has leased the forging plant of C. C. Bradley & Son Inc., Syracuse, N. Y. Complete hammer equipment has been installed and is now in operation. The company will be known as the Irving Forgings Corp., and will manufacture weldless rings, blocks, gear blanks, spindles and special shape forgings.

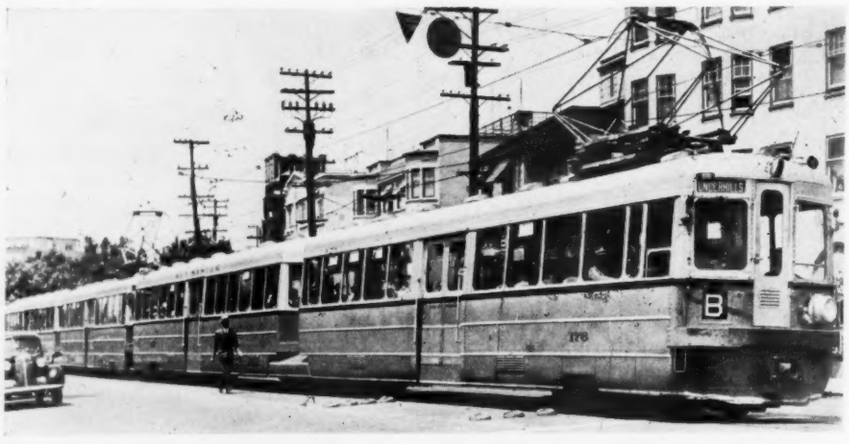
♦

Metallizing Co. of America Inc., Los Angeles, has changed its distributor policy and all sales and service now are handled direct by factory branches. New York and Chicago offices have been consolidated into a central office at 562 West Washington boulevard, Chicago. E. T. Parkinson, formerly manager of the company's San Francisco office will be in charge of the instruction department at this address.

♦

Roots-Connersville Blower Corp., Connersville, Ind., has appointed two additional territorial representatives for turbine pump sales. W. J. Brown, Charleston, W. Va., will cover West Virginia, except the panhandle section; and adjoining counties in Ohio and Kentucky. Other products will continue to be handled from the general offices at Connersville. Hiram H. Haight, Milwaukee, will promote turbine pump sales in the nine counties comprising the metropolitan trading area, other lines continuing in charge of the Chicago district office.

Light-Weight Cars for "Key System"



■ **These light-weight, articulated cars were built at Bethlehem Steel Co.'s Wilmington, Del., plant for the Oakland-San Francisco bay "Key System" line. They are made largely of Mayari R low-alloy, high-strength, corrosion-resistant steel. In addition to the original 63 two-car units, a second group of 26 cars are now being put into service**

MEETINGS

PRODUCTION CONFERENCE TO STUDY UNIT COSTS

■ A PRODUCTION conference which will be devoted to study of methods of keeping down unit costs will be held Nov. 9-10, at Hotel Pennsylvania, New York, by the production division, American Management association.

Alvin E. Dodd, association president, said this division usually holds an annual conference in the spring, but a complete review and study of unit costs has become such a pressing problem the association decided to give it immediate attention through the conference method of investigation.

The conference will be led by Raymond S. Perry, vice president, Ingersoll Milling Machine Co., Rockford, Ill. A panel of manufacturing executives representing 12 major industries will discuss production techniques in their respective companies.

INSTRUMENT CONTROL IS TOPIC FOR MEETING

To bring about a better knowledge of advances made in measurement and control in steelmaking, metallurgical department, Carnegie Institute of Technology, Pittsburgh, is sponsoring a conference on instrumentation in the steel industry, Oct. 13-14. Richard Rimbach, supervisor of extension and evening courses, is arranging the conference.

1939 ROAD SHOW GOES TO SAN FRANCISCO IN MARCH

Thirty-sixth annual convention and road show of the American Road Builders' association will be held in Civic auditorium, San Francisco, early in March, 1939, according to C. D. Macpherson, Gar Wood Industries Inc., Detroit, member of the executive committee of the association's manufacturers' division. The event will take place soon after opening of the Golden Gate exposition.

A. S. M. E. RUBBER COMMITTEE SCHEDULES SYMPOSIUM

Newly organized committee on rubber and plastics of the American Society of Mechanical Engineers will conduct a symposium on rubber during the fall meeting of the society at Providence-Biltmore hotel, Providence, R. I., Oct. 5-7. Sessions in morning and afternoon, Oct. 5, will emphasize mechanical problems in the production and use of rubber.

Four papers are scheduled as follows: "Engineering History of Rubber," by Dr. W. C. Geer, Ithaca, N. Y.; "Synthetic Substances with Rubber-Like Properties," by E. R. Bridgewater, E. I. du Pont de Nemours & Co., Wilmington, Del.; "Problems in Production of Rubber," by E. G. Kimmich, Goodyear Tire & Rubber Co., Akron, O.; and "Mechanical Characteristics of Rubber," by F. L. Haushalter, B. F. Goodrich Co., Akron, O.

The committee will meet in the evening to discuss projects for the future. Providence plant of U. S. Rubber Co. will be visited on the afternoon of Oct. 6.

Convention Calendar

Sept. 26-27—Tenth Boston Conference on Distribution. Hotel Statler, Boston. Daniel Bloomfield, 80 Federal street, Boston, is director.

Sept. 27-30—Association of Iron and Steel Engineers. Thirty-fourth annual convention and exposition at Public auditorium, Cleveland. Brent Wiley, 1010 Empire building, Pittsburgh, is managing director.

Oct. 3-4—National Lubricating Grease institute. Sixth annual meeting at Stevens hotel, Chicago. George W. Miller, 498 Winspear avenue, Buffalo, executive secretary. (Corrected notice.)

Oct. 5-7—American Society of Mechanical Engineers. Fall meeting at Providence-Biltmore hotel, Providence, R. I. C. E. Davies, 29 West Thirty-ninth street, New York, is secretary.

Oct. 7-8—American Foundrymen's association. Second annual regional conference at Missouri School of Mines and Metallurgy, Rolla, Mo.

Oct. 10-11—Associated Machine Tool Dealers of America. Annual meeting at Hotel Alms, Cincinnati. Thomas A. Fernley Jr., 505 Arch street, Philadelphia, is executive secretary.

Oct. 10-12 — American Gear Manufacturers' association. Twenty-first semi-annual meeting at Skytop lodge, Skytop, Pa. J. C. McQuiston, 701 Shields building, Wilkinsburg, Pa., is manager-secretary.

Oct. 10-14—American Gas association. Twentieth annual convention at auditorium, Atlantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 10-14 — National Safety council. Twenty-seventh national safety congress at Stevens hotel, Chicago. W. H. Cameron, 20 North Wacker drive, Chicago, is managing director.

Oct. 11-14—American Institute of Steel Construction. Sixteenth annual convention at French Lick Springs, Ind. V. G. Iden, 200 Madison avenue, New York, is secretary.

Oct. 12-14—Porcelain Enamel institute. Third annual forum at University of Illinois, Urbana, Ill. C. S. Pearce, 612 North Michigan avenue, Chicago, is secretary.

Oct. 12-15 — Electrochemical society. Meeting at Hotel Seneca, Rochester, N. Y. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Oct. 13-14—Carnegie Institute of Technology. Conference on instrumentation in steel industry, at the Institute, Pittsburgh. Prof. Richard Rimbach, supervisor extension and evening courses, metallurgical department, is in charge.

Oct. 13-15—American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, Western Society of Engineers. Joint meeting on coal at Palmer House, Chicago.

Oct. 13-15—Society of Automotive Engineers. National aircraft production meeting at Ambassador hotel, Los Angeles. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Oct. 14-15—American Society of Tool Engineers. Semiannual meeting at William Penn hotel, Pittsburgh. Ford R. Lamb, 2567 West Grand boulevard, Detroit, is executive secretary.

Oct. 14-16 — National Association of Foremen. Annual convention and exposition at Goodyear hall, Akron, O. Headquarters are at 232 Madison avenue, New York.

Oct. 17-19 — National Association of Waste Material Dealers. Fall convention in San Francisco. C. M. Haskins, 1109 Times building, New York, is secretary.

Oct. 17-19 — Farm Equipment institute. Forty-fifth annual convention at French Lick Springs, Ind. R. A. Jones, 608 South Dearborn street, Chicago, is secretary.

Oct. 17-20—National Wholesale Hardware association. Forty-fourth annual convention at Marlborough-Blenheim, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 17-20—American Institute of Mining and Metallurgical Engineers. Fall meetings of Institute of Metals and Iron and Steel divisions at Book-Cadillac hotel, Detroit. Louis Jordan, 29 West Thirty-ninth street, New York, is assistant secretary.

Oct. 17-21—American Society for Metals. Twentieth national Metal congress and exposition at Statler hotel, Detroit. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Oct. 17-21—American Welding society. Nineteenth annual meeting at Book-Cadillac hotel, Detroit. Miss M. M. Kelly, 33 West Thirty-ninth street, is secretary.

Oct. 17-21 — Wire association. Annual meeting at Detroit-Leland hotel, Detroit. R. E. Brown, 17 East Forty-second street, New York, is secretary.

Oct. 17-21—Wire Machinery Builders' association. Annual meeting at Detroit-Leland hotel. W. D. Pierson, Box 70, Waterbury, Conn., is secretary.

Larger Proportion of Steel Moved by Water

■ Although steel production in the Pittsburgh district in August averaged only 38 per cent of August, 1937, shipments of steel products on the Ohio river were 82 per cent of last August, and on the Monongahela river, 49 per cent.

The Ohio river carried 109,000 short tons of steel products in August, compared 77,850 tons in July, and 133,650 tons in August, 1937. Steel shipments on the Monongahela in August totaled 49,200 short tons, in July 43,450 tons, and in August, 1937, 94,600 tons. The Allegheny river in August carried 3300 tons, in July 2520 tons, and in August last year 8750 tons.

EDITORIAL

A.I.S.E. Shows High Steel Technique

■ AT AN INFORMAL meeting of some 20 electrical engineers in Pittsburgh in 1907 a proposal was made that an association of electrical engineers in the iron and steel industry be formed. Those present believed progress in this branch of engineering could be accelerated greatly as a result of a co-operative approach on problems of mutual interest through such an organization. From this proposal the Association of Iron and Steel Electrical Engineers came into being.

Since that time the technique of producing iron and steel has been revolutionized. Steam engines and gears have been superseded by electrical drives featured by synchronized speed motors. Highly developed electrical equipment and the perfection of antifriction bearings have been vital factors in the development of continuous strip mills with delivery speeds as high as 2100 feet a minute. They have made it possible to produce today's sheets and tin plate largely from strip. Operations throughout the industry benefit from control devices developed in recent years.

Association Has Led Progress In Developing Mill Practice

These are only a few of the vital changes in steel mill practice in which the electrical engineer has had a leading part. Credit for much of this progress is attributable to the association. Through its discussions, its technical papers and its other activities it has done much to broaden the viewpoint and ability of its members. It has been an important factor in developing a spirit of co-operation between members, between men of the various departments of the steel industry, and between these men and the representatives of equipment and materials supplying companies.

In the development of this progress the ties between the electrical engineer and the mechanical, metallurgical, combustion, welding and other steel plant departments automatically became so close that the old name no longer was appropriate. In 1936 it was changed to a more representative one, the Association of Iron and Steel Engineers.

To this organization Cleveland this week will act as host, on the occasion of its thirty-fourth convention and iron and steel exposition.

As was recounted in last week's issue of STEEL the technical program, perhaps the best ever presented by the association, will include 20 papers of interest to all key men in the industry. More than 100 manufacturers of steel mill equipment will exhibit their latest designs and products in Cleveland's public auditorium. Attractive inspection trips have been arranged.

Opportunity Afforded To Study Most Advanced Methods

STEEL is glad to quote from a letter by President L. F. Coffin which explains why attendance at this event is a matter of moment.

"The importance of engineering in the steel industry," says Mr. Coffin, "strongly emphasizes the value of co-operation with engineering activities. To our members and to those in the steel industry who should be our members, this convention and the exposition offer the dual opportunity of obtaining the most advanced information on steel mill practice, as well as a better understanding of the problems and experiences of others in the industry.

"Active participation in the various activities of the convention, which means full use of the advantages afforded by the technical discussions and by careful study of the equipment and materials offered through the exhibits, cannot help but inspire new views, new ideas—and it is from such substance that progress and development spring forth."

THE BUSINESS TREND

Activity Index Recoups Holiday Losses

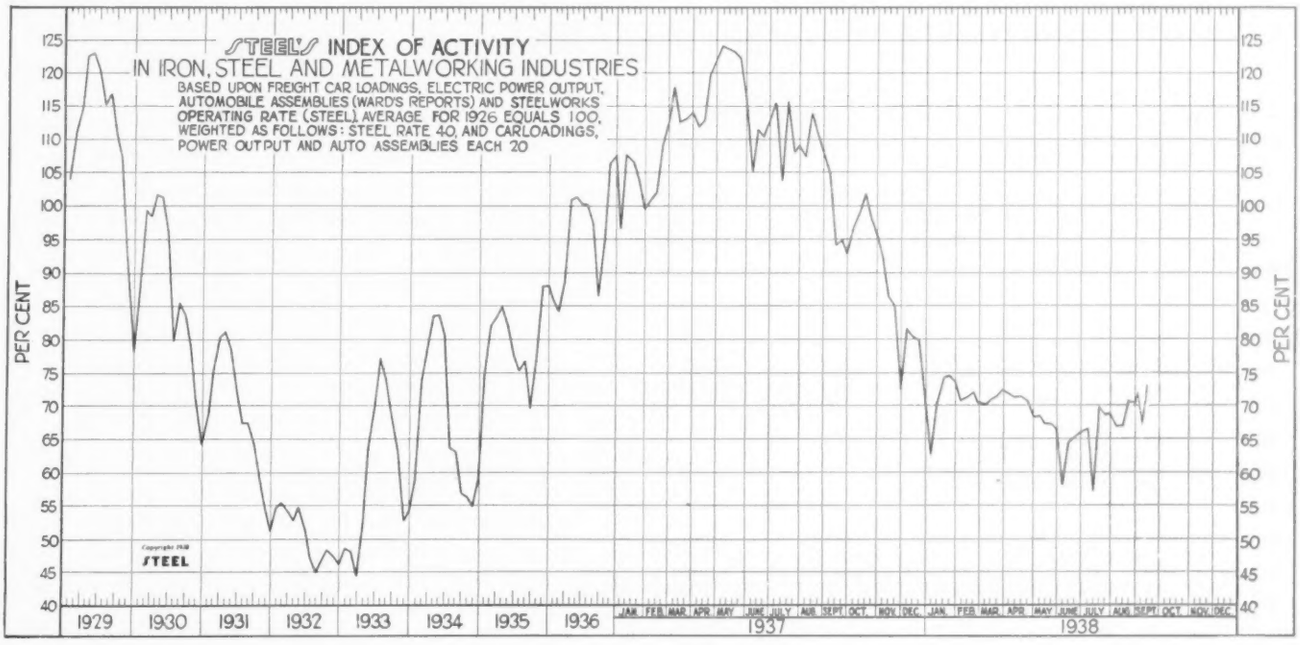
■ THE rebound in industrial activity from the holiday lows has aided measurably in bolstering the confidence of many industrial leaders. Reflecting this gain in activity in the iron, steel and metalworking industries, STEEL'S index recouped all the loss incurred during the Labor day week. It now stands at 72.9 per cent, compared with 66.8 in the preceding week and with 72.3 per cent in the week ended Sept. 3. A year ago the index stood at 95.0.

As may be readily seen from the index chart below, comparisons with a year ago will now begin to show up much more favorably than they have in 1938 to date, since last autumn business started its sharp decline.

Steelmaking operations during the week ended Sept. 17 not only advanced to a new high for any week this year, but is also the best rate since Nov. 6, 1937. The national steel rate of 46 per cent represents an increase of 4.5 points from the holiday low. Further gains to higher levels are indicated in the current week.

The anticipated slight increase in automobile assemblies for the week ended Sept. 17 would have materialized had not a strike at Briggs Mfg. Co. forced the cessation of production operations at Plymouth Motor Corp. The week's net output was 16,100 units, compared with 17,485 in the week ended Sept. 10. This time last year, when output was still narrowing toward a 1937 low, assemblies totaled 30,150. Used cars and passenger car field stocks are said to be at encouraging low levels, thus bolstering the predictions of many that sales of 1939 models will register substantial gains through the fall months.

Early estimates of revenue freight carloadings indi-


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40
1929 1930 1931 1932 1933 1934 1935 1936
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1937
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
STEEL

STEEL'S index of activity gained 6.1 points to 72.9 per cent in the week ended Sept. 17:

Week ending	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
June 11	64.4	111.4	99.4	80.0	82.3	69.9	51.1	73.2	96.2	120.1
June 18	65.2	110.3	101.0	77.3	83.6	72.1	51.8	70.9	95.0	120.1
June 25	66.0	112.8	101.9	78.4	81.8	73.9	51.6	70.6	94.0	120.0
July 2	66.5	115.3	97.5	64.1	79.4	77.0	49.2	64.1	75.0	107.8
July 9	57.1	103.8	100.9	76.5	52.3	71.4	41.7	69.4	86.9	116.8
July 16	69.9	115.7	99.9	79.8	67.8	79.1	46.9	70.0	79.1	115.5
July 23	68.7	108.0	102.1	80.8	68.1	79.4	51.5	69.7	78.7	120.8
July 30	69.0	109.1	102.5	78.4	66.4	78.8	46.1	68.9	79.2	117.3
Aug. 6	66.9	107.3	98.7	73.4	64.6	75.9	45.1	67.0	85.6	117.2
Aug. 13	66.9	113.8	92.6	77.5	64.6	74.7	44.6	67.4	86.2	116.8
Aug. 20	70.5	110.3	97.7	77.0	61.4	74.2	44.9	67.3	88.5	116.4
Aug. 27	70.3	108.5	94.0	77.3	60.3	71.6	45.2	66.5	87.4	116.9
Sept. 3	72.3	104.8	87.5	70.9	55.1	70.3	45.4	65.3	79.0	106.3
Sept. 10	66.8†	94.3	83.1	70.1	53.5	65.5	44.9	60.9	85.9	114.0
Sept. 17	72.9*	95.0	90.1	69.4	58.7	69.1	47.8	65.6	86.2	112.2

*Preliminary. †Revised.

cate an increase of approximately 85,000 cars to 661,615 for the week ended Sept. 17. This represents the highest point touched by carloadings this year, although it still remains well below the comparable week in 1937 when 826,565 cars were moved. Reflecting the anticipated general pick-up in activity through the fall months, railroad freight traffic should continue to benefit accordingly. Electric power consumption broke through the 2,200,000,000 kilowatt-hour level to reach the highest weekly output since Nov. 20, 1937. Power consumption for the week ended Sept. 17 totaled 2,214,775 kilowatt-hours against 2,048,360,000 in the preceding week, a gain of approximately 8.1 per cent.

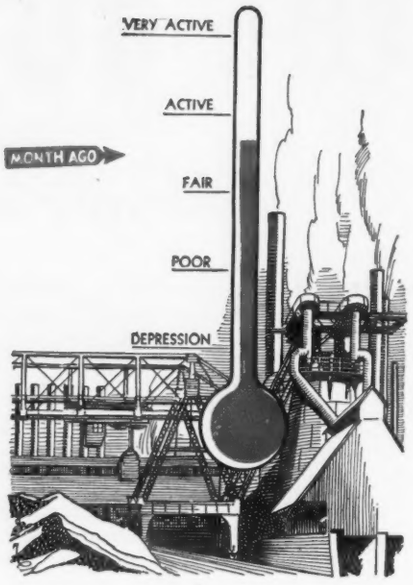
Foundry equipment and machine tool orders during August continued the improvement which started in June. The substantial gains registered in these two barometers from the low levels then prevailing is particularly encouraging, for it reflects a change in confidence of corporate officials who have undertaken capital expenditures for plant equipment.

Volume of construction contracts awarded in the 37 eastern states during August also recorded substantial gains, according to F. W. Dodge Corp. The month's total, valued at $313,141,000 and representing an area of 38,527,000 square feet, was the largest volume of construction contracts since July, 1937. In line with other improvements during August, the number of commercial failures declined from 995 in July to 974. Failures during August represented liabilities of $11,692,000. It is the first time since November, 1937, that liabilities have been smaller than in the previous year.

With the abatement of war fears, the basic seasonal factors should continue unhampered to provide a momentum for further recovery. Developments within the next few weeks will definitely demonstrate whether or not business is prepared to extend the moderate gains witnessed during July and August.

Industrial Weather

TREND: *Upward*



Where Business Stands

Monthly Averages, 1937 = 100

	Aug., 1938	July, 1938	Aug., 1937
Steel Ingot Output	59.1	49.7	117.5
Pig Iron Output	47.9	38.9	115.9
Freight Movement	83.8	78.3	107.3
Building Construction	103.0	89.1	109.3
Automobile Production	20.3*	36.0	96.9
Wholesale Prices	90.3*	91.3	101.4

*Preliminary.

The Barometer of Business

Industrial Indicators

	August	July	August
Pig iron output (Daily average, tons)	48,234	39,131	116,676
Machine Tool Index	93.6	75.5	180.9
Finished Steel Shipments	558,634	441,570	1,107,858
Ingot output (Daily average, tons)	94,333	79,282	187,608
Dodge Bldg., awards in 37 states (sq. ft.)	38,527,000	33,308,000	40,880,100
Automobile output	*85,000	150,444	405,064
Coal output, tons	28,280,000	23,357,000	33,988,000
Business failures; number	974	995	707
Business failures; liabilities	$11,692,000	$10,793,000	$11,916,000
Cement production, Bbls.	.....	10,967,000	11,894,000
Cotton consumption bales	561,000	449,511	604,000
Car loadings (weekly average)	608,016	568,225	778,927

* Preliminary.

Foreign Trade

	August	July	August
Exports	.....	$227,780,000	$277,695,000
Imports	.....	$140,836,000	$245,707,000
Gold exports	.....	$65,000	$105,013,000
Gold imports	.....	$63,880,000	$169,000

Financial Indicators

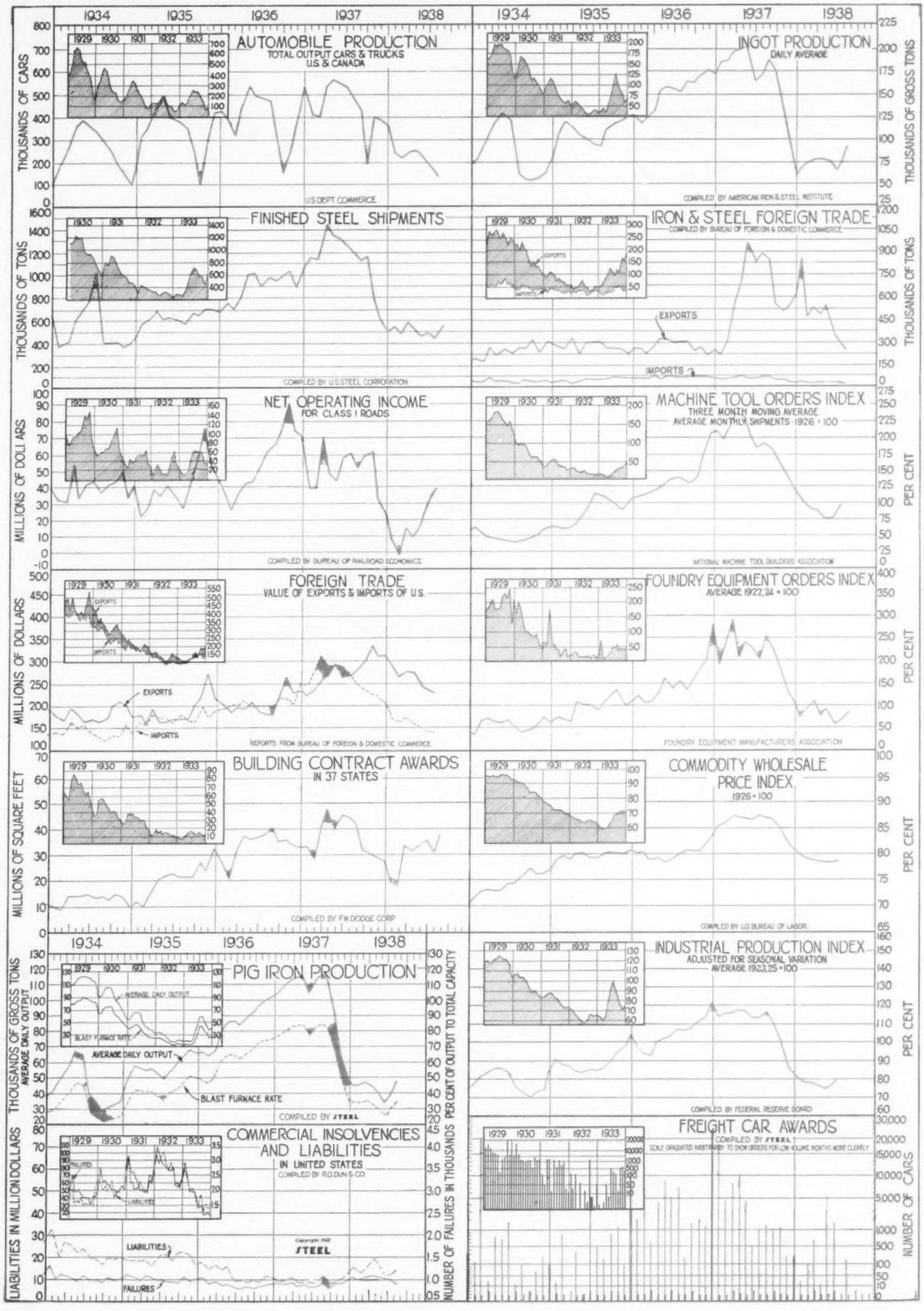
	August	July	August
25 Industrial stocks	$176.16	$176.59	$220.18
25 Rail stocks	$22.09	$21.79	$30.13
40 Bonds	$70.98	$70.57	$83.63
Bank clearings (000 omitted)	.....	$21,624,000	$22,260,000
Commercial paper rate (N. Y., per cent)	¾	¾	1
* Commercial loans (000 omitted)	$8,270,000	$8,161,000	$10,027,000
Federal Reserve ratio, per cent	82.4	82.4	79.6
Railroad earnings	†$38,387,209	$25,000,803	$60,557,576
Stock sales, N. Y. stock exchange	20,722,930	38,761,675	17,220,623
Bond sales, par value	$120,531,425	$178,157,075	$148,009,375

* Leading member banks Federal Reserve System.
† July, June and July, respectively.

Commodity Prices

	August	July	August
STEEL'S composite average of 25 iron and steel prices	$36.50	$36.32	$40.34
U. S. Bureau of Labor index	*77.9	78.8	87.5
Wheat, cash (bushel)	$0.79	$0.85	$1.22
Corn, cash (bushel)	$0.68	$0.72	$1.19

* Preliminary.


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT. COMMERCE
THOUSANDS OF CARS
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
THOUSANDS OF TONS
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
THOUSANDS OF TONS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MILLIONS OF DOLLARS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
EXPORTS
IMPORTS
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
MILLIONS OF DOLLARS
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
PER CENT
BUILDING CONTRACT AWARDS
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
MILLIONS OF SQUARE FEET
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PER CENT
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
PER CENT
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
FAILURES
LIABILITIES
Copyright 1938 STEEL
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

SUPERFINISHING

New method produces a finish that closely approaches a perfectly flat surface and reduces wearing in of closely fitted parts. Method is suitable for high production work

■ SOME five years ago Chrysler automobiles shipped by rail to the west coast developed a peculiar condition in rear wheel bearing races. Constant jostling of cars during shipment appeared to indent or "brinell" portions of race surface on which the load was carried; repeated pressure of bearing rollers on races appeared to peen an impression in the ground surface approximately the same depth as the grinding scratches in the race, necessitating replacement of the entire bearing.

Continued recurrence of this phenomenon stimulated investigation by Chrysler Corp. production research engineers. Out of it has come an entirely new metal finishing method and a new conception of character and functioning of machined, ground, honed and lapped surfaces as far as wear is concerned.

After experimenting with various methods of finishing the surfaces of these defective races, it was discovered that a combination of light pressure and an oscillating motion on an abrasive stick removed a sufficient quantity of metal to eliminate the

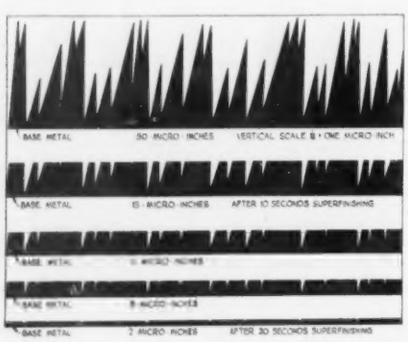


Fig. 1—Diagram shows steps in development of a smooth surface by superfinishing

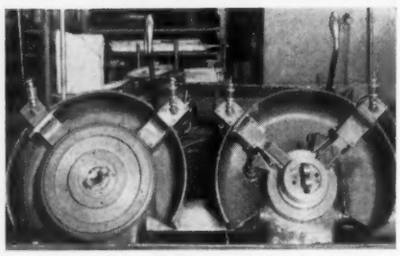


Fig. 2—Equipment for superfinishing flywheels

brinelled portions. It was decided that the finish grinding operation on the races had produced a certain amount of surface ductility by virtue of the heat involved, causing the metal to yield under pressure of rollers until "base" metal had been reached. The newly developed abrasive process, later to be known as "superfinishing," had in effect lightly scoured off this annealed portion so entire surface became the base metal or nearly so.

A special type of machine was developed to finish these wheel races, involving a mechanically oscillated head carrying abrasive stones in light contact with the races. The surprising thing about the process was that in a matter of a few seconds the surface was smoothed off and the brinelled impressions disappeared.

At this point it was realized by D. A. Wallace, president of the Chrysler Sales division of Chrysler Corp., under whose direction the research was being carried out, that a really important advance in surface finishing had been encountered. Repeated checks on the method showed it possible to duplicate original test results.

Now, after three years of research has proved its commercial applicability, it is in use on a variety of production parts. Process is essentially an extremely fine surface finish produced upon flat, internal, external, round, concave, convex and other types of surfaces by a "scrubbing" action accomplished by a combination of multimotion of the abrasive material, light abrasive pressures, slow and constantly changing abrasive cutting speeds, comparatively hard abrasive stones of medium grit and a lubricant of proper viscosity which eliminates scratches and surface defects created by previous mechanical opera-

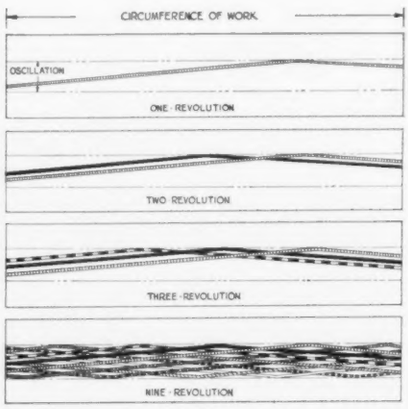


Fig. 3—Path generated by single particle of stone grit does not repeat

tions without creating scratches or defects in the superfinished surface. Abrasive and work motion is such that a single abrasive particle follows a path as indicated in Fig. 3, preventing formation of scratch lines.

At the same time a bearing surface is left in which any scratches that are visible to the eye, or

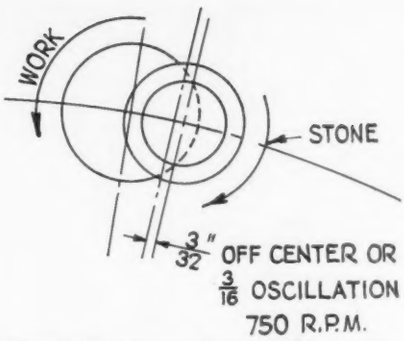


Fig. 4—Diagram of setup for superfinishing a tapped head

through the microscope, will be below the mechanically made bearing surface, serving as a reservoir for lubricant. Superfinishing provides a method for producing the ultimate bearing and practically eliminates the wearing in of bearing surface after the parts are assembled and in operation.

In the production of a superfinished surface, at least three motions of the tool with relation to the work are necessary, and on some jobs as many as ten such motions have been combined. Pressure on the abrasive tools is limited from a few ounces to a few pounds and preferably is applied progressively. Light at the start, it is increased as nearly as possible in proportion to the greater area of work to be covered. It will be readily understandable that as the abrasives progress nearer to the base metal a greater area must be covered.

For a graphic conception of superfinishing, refer to Fig. 1, which shows in greatly enlarged form the steps in the development of a smooth surface from a relatively rough (ground) surface by the superfinishing process. At the top is the rough surface showing average smoothness of 50 microinches, (0.000050-inch), this being the average distance from the tops of the jagged peaks to the valleys near the base metal. Ten seconds of superfinishing literally slices off the crests of the scratches and reduces average roughness to somewhere in the neighborhood of 15 microinches. Additional seconds of superfinishing practically obliterate the scratches altogether, bringing average roughness to only 2 microinches.

Abrasives used are the common synthetically produced abrasive stones of proper grain and hardness, from 300 to 500 grit being the recommended range. Abrasive speed is 8 feet per minute, compared with speeds of 3000 to 8000 feet per minute in grinding, 400 to 1000 feet per minute in honing, and 20 to 100 feet per minute in lapping.

Lubricant viscosity in superfinishing is most important since basically this is what prevents the production of scratches in the operation. As the abrasive stones work increasingly closer to the base metal under slow speed and low pressure, the pressure per unit of area becomes progressively lighter and affords a larger surface for carrying a film of lubricant, the viscosity of which is sufficient to hold the cutting stone away from the finished surface far enough to prevent further scratches.

The superfinishing process does not remove enough material to make any appreciable change in the dimensional size of a part, unless the part carries less than 0.0005-inch total limit. Temperature rise produced by superfinishing is substantially below the critical point of the material, thus creating no surface ductility.

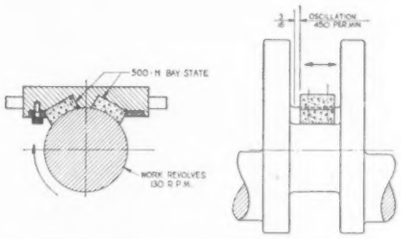


Fig. 6—Method of superfinishing a crankshaft bearing

It is the conception of Chrysler engineers that wear between moving parts is caused by the points or peaks of scratches rupturing the oil film, then abrading against each other and breaking off, resulting in loose fits. In superfinished surfaces these high points of turned and ground surfaces are eliminated and there is nothing to break the oil film over the adjoining surfaces. And as long as the mating surfaces are separated by an oil film there is practically no wear.

Of invaluable assistance in carrying on the research work in connection with superfinishing has been the perfection of a means for obtaining accurate and visual indication of the character of a finished surface. This is accomplished with equipment designed by Dr. E. J. Abbott of the Physicists Research Corp., Ann Arbor, Mich., and was described in detail in STEEL for Aug. 15, 1938, page 58. Essentially it comprises a diamond-pointed tracer unit on which a small coil of wire is mounted, this assembly be-

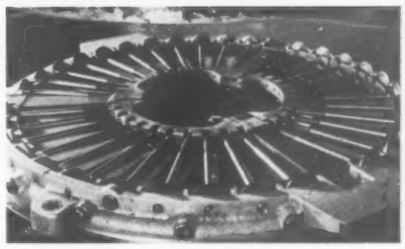


Fig. 7—This holder accommodates 33 valves for superfinishing

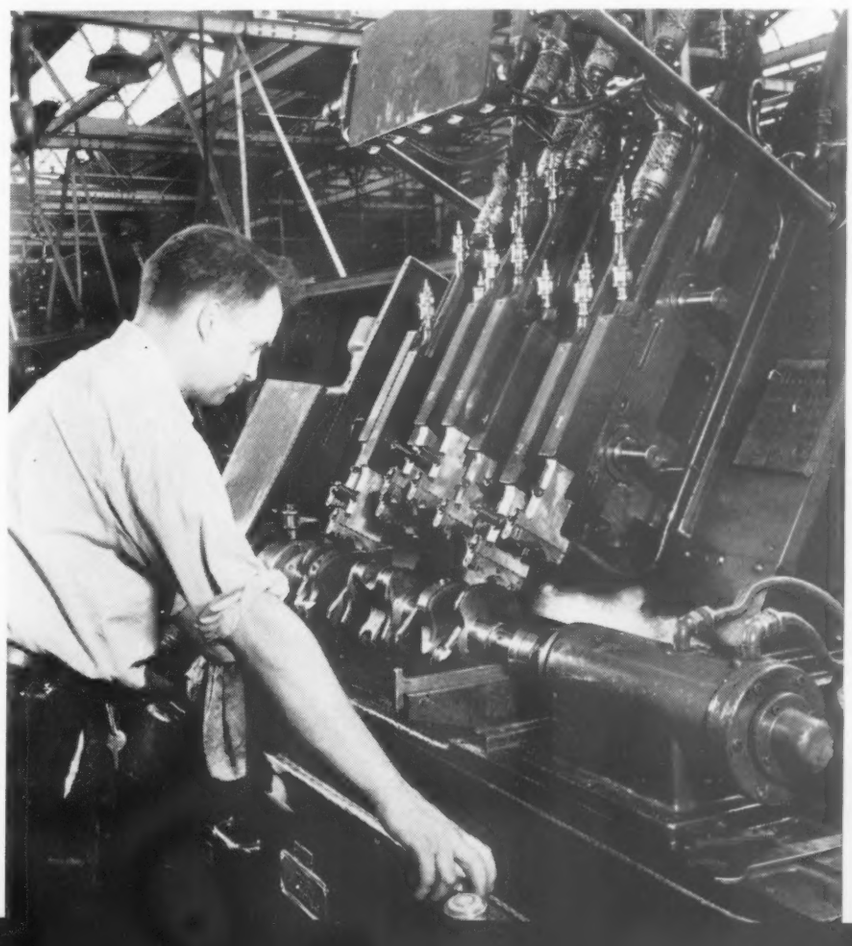


Fig. 5—This superfinisher handles crankshaft rod bearings

ing carried on springs between the poles of an electromagnet. Movement of the tracer, however small, is translated into voltage in the coil which in turn may be amplified to any suitable extent, thus giving a measurement of the profile of the surface.

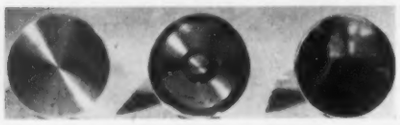


Fig. 8—Superfinishing brings out defects in grinding as shown in center piece here where high spots at center and edge are visible. A ground surface is at left, superfinished surface at right

Scratches in the surface may be measured directly through proper calibration of the electrical circuit and the result shown on a galvanometer. Adding a cathode ray oscillograph and a motor-driven camera, a photograph of the surface explored may be obtained. Variations as minute as one millionth of an inch (0.000001-inch) are measured easily with this equipment.

Machines have been built for superfinishing a wide variety of surfaces. Already Chrysler Corp. is using the process on some valve stems, flywheels, pistons, crankshafts and camshafts, cylinder walls, brake drums, piston pins, bearing races, etc. Process may be applied readily to other types of surfaces such as moldboards on farm plows, stainless steel sheets, steel mill rolls, paper rolls and paint rolls.

Research in connection with superfinishing shows that depth of scratches remains practically nominal within reasonable limits; that is, scratches produced by a 300 grit wheel are not measurably deeper than those produced by a 500 grit wheel. The chief difference lies in the scratch pitch or width, the average distance between peaks.

A turned finish will show scratches of large pitch, and a grinding operation on this surface will reduce the pitch of the scratches. Honing then will still further reduce the scratch pitch. Superfinishing finally will practically eliminate the scratches altogether, except for those extending below the base line of the metal. It is possible to produce a finish free from all measurable or visual scratches by superfinishing if enough time is taken for the operation.

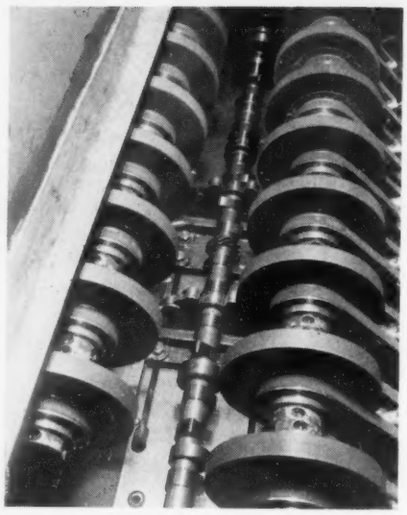


Fig. 10—Here 16 rotating and oscillating wheels complete superfinishing of a cam surface on a cam shaft every 20 seconds

As mentioned before, one essential of the superfinishing process is the proper ratio of work movement to stone movement. This produces the cross-hatch pattern shown enlarged in Fig. 3, where the path of a single grain of abrasive is traced for 1, 2, 3, and 9 revolutions.

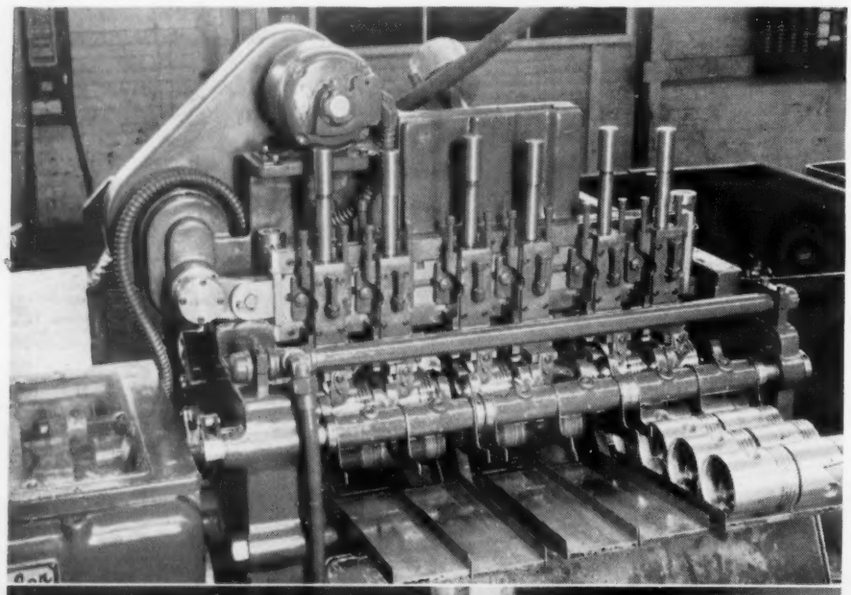
Production Varies

Production per set of stones varies of course with size of the part. Valve stems, because of the small area involved, show relatively the best production with 300,000 pieces per set of two stones.

Detail of how a tappet head is set up for superfinishing is given in Fig. 4. A cup-shaped arasive stone is used, mounted 3/32-inch off center and rotating at 750 revolutions per minute in a direction opposite to the tappet head which revolves at 950 revolutions per minute. Fig. 6 shows a similar setup for rod bearing surfaces of crankshafts. Here two abrasive stones oscillate 3/16-inch 450 times a minute while the work rotates at 130 revolutions per minute.

Equipment for superfinishing work is being built by Foster Machine Co., Elkhart, Ind. Examples shown in accompanying illustrations are being operated in Chrysler plants. Fig. 2 shows the setup for finishing flywheels, with a flywheel in position at the left and the ar-

Fig. 9—Six aluminum pistons are finished simultaneously in this equipment



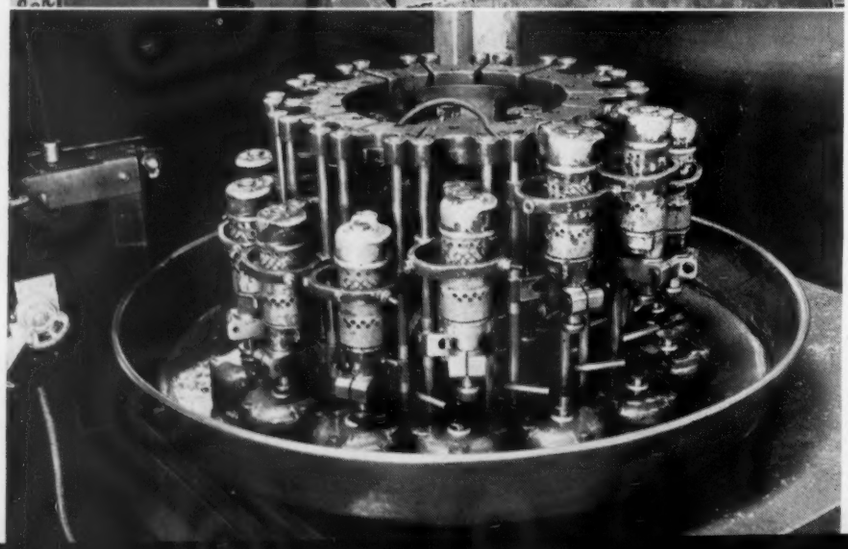


Fig. 11—This 14-spindle machine superfinishes tappet heads

rangement of the oscillating stones shown on the fixture at the right of the illustration.

Fig. 5 shows the machine developed for finishing crankshaft rod bearings. Small motors at ends of arms carrying the abrasive stones oscillate the stones while in contact with rotating shaft. This is the setup presented graphically in Fig. 6. Fig. 9 shows superfinishing of pistons.

Valve stems are being superfinished in Fig. 7 where 33 valves are mounted in the work holder which is stationary. Vertical shafts carrying the abrasive tools rotate and oscillate; upper and lower stones oscillate and revolve in opposite directions and at different speeds.

The 10 cam surfaces on an 8-cylinder camshaft are finished in a matter of 20 seconds with the machine in Fig. 10, where a shaft is shown in position but with abrasive wheels retracted. Camshafts pass through two machines, the second having seven vertical spindles carrying abrasive tools for superfinishing the bearing surfaces on the shaft.

Not Limited to Metals

Superfinishing is not necessarily limited to metals. Machine in Fig. 12 was developed to finish surfaces of brake shoe linings to insure overall contact of lining with brake drum. Abrasive tool holder is shown at base of machine with a set of shoes in the machine. The abrasive fixture is carried in the head. Shoes raised inside the fixture are expanded by pneumatic pressure to come in contact with the stones. Die spindle carrying stones rotates first in one direction then in opposite direction with an oscillating motion imparted to the abrasive fixture during this cycle.

Fig. 11 shows the machine developed for superfinishing tappet heads, the setup presented diagrammatically in Fig. 4. This 14-spindle machine uses small high-cycle motors which drive and oscillate the cup-shaped abrasive tools.

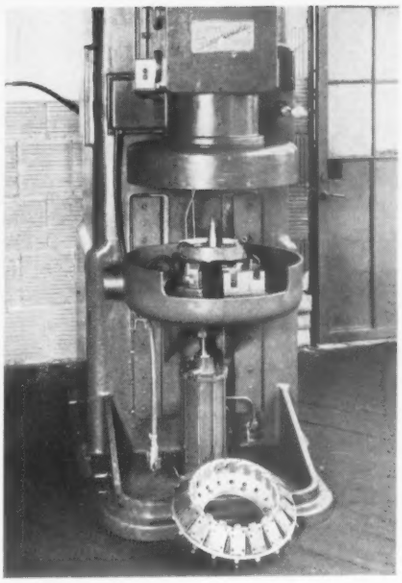


Fig. 12—Brake shoe linings are superfinished here, the abrasive holder rests on machine base

Defects in grinding practice not readily visible to the eye are quickly shown up by the superfinishing process. Fig. 8 shows such defective work on a tappet head. At the left is the ground head, apparently satisfactory. A few seconds of superfinishing, however, brings out the condition shown in the center, indicating that the grinding has left high spots at the edge and near the center. Thus a quick check is provided on production grinding operations in addition to the valuable qualities imparted by superfinishing a surface that is ground correctly.

Obviously the process has interesting possibilities in fields other than automotive parts, and Chrysler engineers are still active in pushing investigational work. Results achieved so far have been exhibited in detail to hundreds of executives and technicians in the machinery and metalworking fields and shortly there should be some profitable adaptation of the method by other industries.

•

Coating Resists Action Of Corrosive Agents

■ A quick-drying solution which may be applied with paint brush or spray equipment to form a protective covering for surfaces subjected to corrosive action of liquids, gases or solids has been announced by American Concrete & Steel Pipe Co., 4635 Firestone boulevard, South Gate, Calif.

This coating will resist action of acid or alkali corrosive agents up to 20 per cent concentration. It is insoluble in salt water or in petroleum derivatives. Known as Amercoat Rapid-Dry coating, it differs from enamel and plastic coatings manufactured by the same company in that it is not particularly intended to resist erosion and abrasion as well as corrosion.

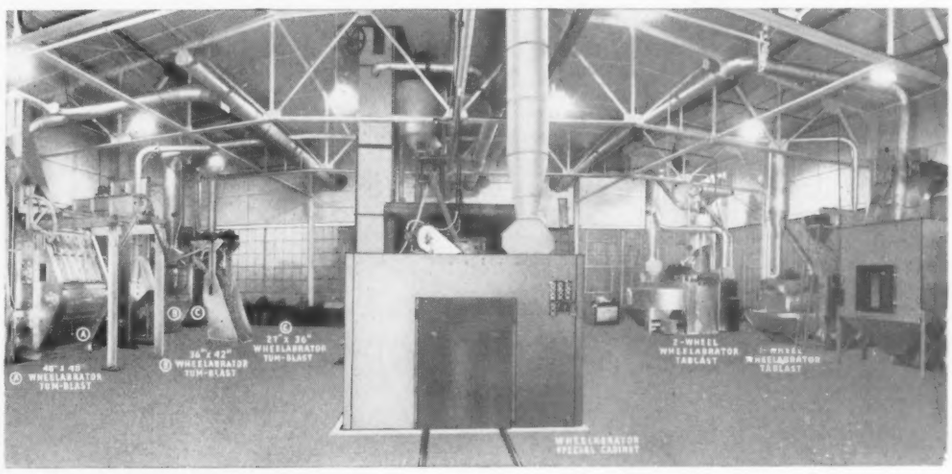
Strip Units Heat Drier

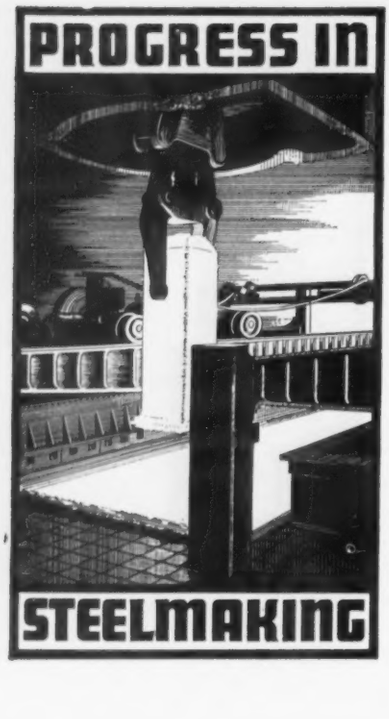
■ Using strip heat to speed drying of painted and enameled parts, oven manufactured by Probeck Mfg. Co., St. Louis, is heated by 34 1-kilowatt General Electric strip units, connected in parallel by special bus bars.

Resembling long strips of perforated ribbon tape, bus bars are formed to fit snugly over terminal studs. Construction saves heating space and permits spacing heaters at any desired interval. Heat up to 450 degrees Fahr. can be obtained, although ordinary drying temperature is about 400 degrees Fahr. Two complete changes of air each minute are assured by control used.

Adds Laboratory

■ This new demonstration room and experimental laboratory recently installed at Mishawaka, Ind., plant of American Foundry Equipment Co. contains complete facilities for cleaning all types of castings on a production basis





Desulphurization

Success in foundry work and at Corby, England, indicates process may soon be widely used here. Several significant economies are seen possible

By GEORGE S. EVANS
Metallurgist
Mathieson Alkali Works Inc.
New York

■ RECENT publicity given operations at Corby, England, steel works has created new interest in the possibilities of desulphurizing.

Certain American operators believe desulphurizing offers one means of increasing open-hearth yields and improvements in steel quality. In fact, several producers have experimented with practically all of the known desulphurizing agents. Some of these are regularly being used today in large scale commercial operations with good results. Also it is the practice to treat offsulphur casts in the blast furnace ladle at a number of plants.

With proper equipment and correct handling, it is believed that sulphur reductions up to 70 per cent of the sulphur present in the iron from the furnace can be obtained uniformly at a cost which will prove economical in many practical plant operations.

By knowing the approximate sulphur content of the metal from the furnace, and varying the treatment accordingly, it is expected that any specifications down to 0.02 per cent sulphur could be met within an approximate range of plus or minus 10 per cent. An 0.07 per cent sulphur iron can be reduced within the approximate range of 0.32 to 0.39 per cent.

Early experiments with desulphurizing in the foundry industry were unsatisfactory because of inadequate or ill-adapted equipment and improper handling. Now, however, comparatively uniform results are being obtained regularly in foundry operations, even with maximum desulphurization. Thus, it should be obvious that extreme variation in blast furnace tests under substantially identical conditions can only result from irregularities or variations in the manner of carrying out the operation. Once causes for these variations have been determined, means can be provided for correcting the conditions.

Reasons for extreme irregularities in tests with additions to the blast furnace ladles include variations of furnace slag coming down with the metal and differences in per cent of kish or entrained silicates in the iron in different casts. The latter two are rapidly washed out by soda slags, both diluting the reagent and reducing the surface contact between the slag and metal and thereby retarding desulphurizing reactions.

Causes for wide variations with desulphurizing between mixer and open-hearth include variations in amount of kish-slag accumulations in the mixer going out with the pour, rate at which the ladles were filled (or extent of agitation by the

Abstract from paper presented at Buffalo meeting of American Institute of Mining and Metallurgical Engineers, April 20-22, 1938.

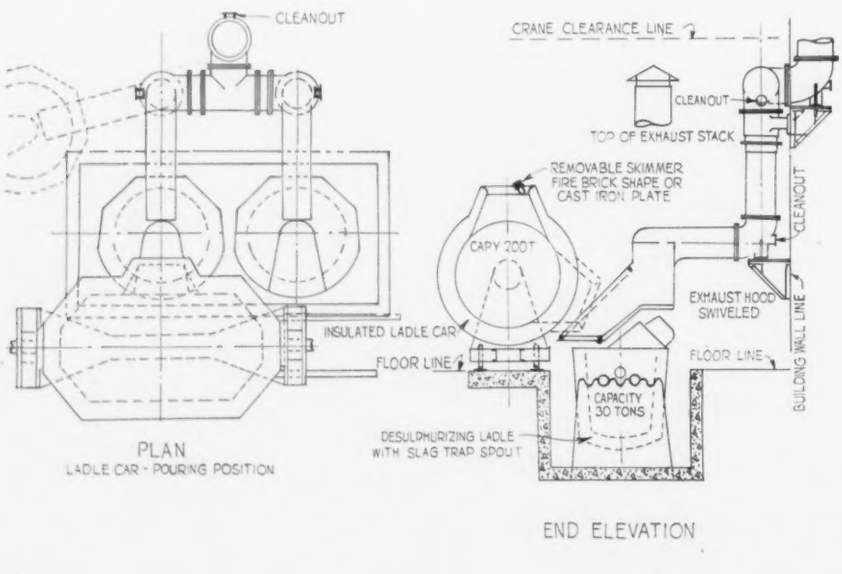


Fig. 1—Desulphurizing layout recommended for blast furnace open-hearth operations

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stream) and time allowed for the reactions.

These many possible variations illustrate the impracticability of attempting to desulphurize as a regular practice in the ordinary blast furnace ladle. However, with proper equipment and correct handling, there is no reason why uniform desulphurizing cannot be obtained either between the blast furnace and mixer or between the mixer and open hearth furnaces.

Slag Held Back

For instance, by holding the metal in a car type ladle for a time any free slag and most of the entrained inclusions would rise out of the bath and could be held back when later pouring into a desulphurizing ladle. Where the iron is treated between the mixer and open-hearth, any kish-slag accumulations in the mixer can be held back by a skimmer arranged in the pouring lip. In both instances, metal should be poured into desulphurizing ladle at a slow rate thus prolonging stirring action of the stream in whipping portions of the refining slag down into the metal bath. This would cause more violent boiling of the metal and slag bath—one essential to rapid and efficient desulphurizing.

Alkalies available for use in obtaining the lower sulphurs required in American open-hearth practice would include, in the order of their activity: Soda ash; soda ash-caustic soda mixtures; caustic soda. Reagent required for best results depends somewhat upon manner of carrying out operations but more largely upon temperature and composition of the metal and the extent of desulphurizing required.

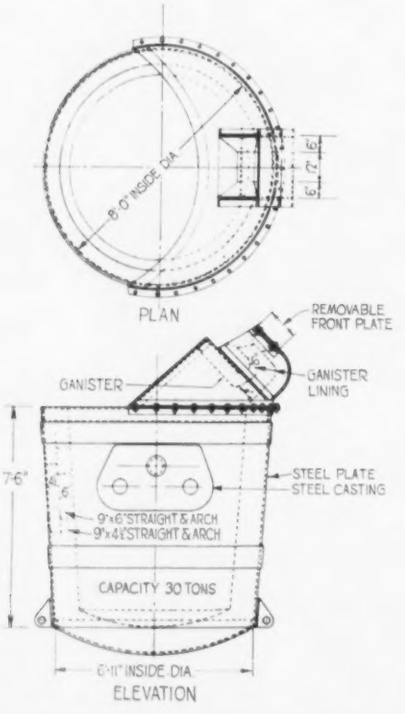


Fig. 2—Dimension diagram of 30-ton slag trap desulphurizing ladle

With temperatures of 2550 degrees Fahr. and over, straight soda ash could generally be used for desulphurizing to the extent of 50 or 60 per cent of the sulphur present. With lower temperatures and for uniform reductions of 70 to 80 per cent, mixtures of caustic soda and soda ash (Sulfex) will generally prove more efficient. On very low temperature metals or for obtaining extremely low sulphurs, straight caustic soda might be required.

A good layout for desulphurizing between the blast furnace and mixer is shown in Fig. 1. This includes a ladle car for holding one complete cast, slag trap spout ladles for multistage desulphurizing and hoods with exhaust stack for carrying off fumes. This layout, with 30-ton ladles, would handle 3000 tons of molten metal per day—also the treatments could be made without otherwise affecting regular operations. The special slag trap spout ladle, illustrated in design and in operation by Figs. 2 and 3 is equally adaptable for desulphurizing between the mixer and open-hearth furnace.

Possibilities for effecting economies by desulphurizing would include:

Increased output in the open-hearth, more particularly when operating on low sulphur specification steels, by affording a continuous supply of constantly uniform metal of any required sulphur content down to 0.02 per cent or lower.

Improvements in uniformity and quality of the finished steel.

Savings in coke and limestone per ton of pig iron produced or the use of lower grade high-sulphur cokes in the blast furnace.

Increased production of the blast furnace which would be expected when operating under more liberal sulphur specifications.

Increased supply of raw materials available to the industry.

Improved Rolling Properties

It is generally believed that prolonged working of a heat to remove sulphur exerts a bad influence on ingot quality. On the other hand, the limited number of open-hearth heats so far made with desulphurized metal have indicated a tendency toward improvements in rolling properties of the metal. Assuming effect on quality is still debatable, desulphurizing offers a practical means of reducing the number of abnormal heats, or of reducing the added working required for very low sulphur specification steels. Thus it would seem that some economies both in furnace time and improvements in quality can be expected.

The operations at Corby referred to in the beginning suggest possibilities for some economies in fuel and for increased output of the blast furnace by operating with a heavier ore burner or leaner slag. This is confirmed by many furnace superintendents in this country who believe that considerable savings in coke, with an increase in output,

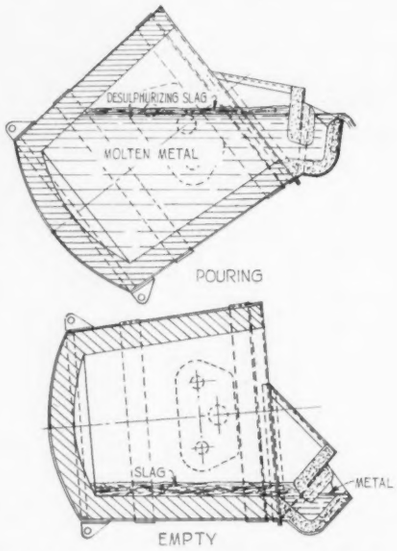


Fig. 3—Slag trap desulphurizing ladle in pouring position at top and at bottom empty except for slag which is held back by trap

would result by running with a leaner slag such as that required to hold sulphur around 0.06 or 0.07 per cent compared to the usual 0.035 per cent or under. No one, however, is yet prepared to give any definite figures.

With proper layout, cost of desulphurizing 0.07 per cent iron to 0.035 per cent (50 per cent reduction) and under, including reagent, labor and refractories, should not exceed 30 cents per ton in the Pittsburgh district. For reducing the same iron down to 0.021 per cent (70 per cent reduction) and under, the cost would approximate 60 cents per ton or less. Under favorable conditions these cost figures might be considerably reduced.

In view of the normal variations in ordinary blast furnace and open-hearth operations, it will require an extended test run such as regular operation covering many thousands of tons to establish the advantages of desulphurizing in the steel industry. But the possibilities for economies in operations and for improvements in product would certainly seem to justify the expenditure necessary to prove this out.

Progress in Foundry Metallurgy Is Revealed at Ann Arbor

■ A NUMBER of important papers detailing recent progress in the field of foundry metallurgy featured the second Fall technical conference of the American Foundrymen's association, Sept. 15-17 at the University of Michigan, Ann Arbor, Mich., in co-operation with the university and the Detroit chapter of the association.

A session on malleable iron was featured by a detailed description, by James H. Lansing, Malleable Founders' society, Cleveland, of the metallurgical changes which take place in the annealing furnace and the various kinds of furnaces used. He described advantages and limitations of each. In discussion Dr. Richard Schneidewind, University of Michigan, said an increase in soaking temperature decreases the tensile strength and desirability of malleable iron. Every 100 degrees of increase in soaking temperature brings a 5 per cent decrease in tensile strength. Mr. Lansing reported impact property of the metal is improved when the second stage of graphitization is held for a considerable period.

Dr. Schneidewind reported some tests on grain size control had been made with alloys such as titanium and zirconium. Metal containing these alloys when annealed at 1740 degrees Fahr. had a fine grain size. If the material is held too long below the critical, however, grain size starts to grow. R. G. McElwee, Vanadium Corp. of America, Detroit, said a combination of titanium and zirconium seems to provide a mixture having a high silicon pressure, resulting in an increased malleablizing rate.

Tube Cost Low

In reply to a question about life of radiant tubes in malleablizing furnaces Carl Joseph, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich., reported on a radiant tube oven his company has operated for two years; the tube cost per ton of metal going through the oven has been low.

Controlled atmospheres for annealing or heat treating were the subject of a paper by John A. Dow, Holcroft & Co., Detroit. Because it is necessary to supply atmospheres that will not add carbon to the material and that will not form scale, a close balance must be maintained in components of atmosphere. Carbon dioxide and water vapor have a decarburizing effect while monoxide and hydrogen have no effect. In malleable annealing it is advisable, therefore, to have an atmosphere lower in carbon dioxide in the first stage annealing than in the second stage. The author stated rate of gas flow over the surface of the material being heat treated has a decided effect; the slower the rate, the lower is the rate of decarburization. The furnace employed, therefore, should be as gastight as possible and the generated gas atmosphere should enter the furnace at several points to provide an excess interior pressure.

New Annealing Setup

Recently a steel company, it was reported by A. B. Kinzel, Union Carbide & Carbon Research Laboratories Inc., New York, installed equipment to bright anneal steel sheets. It provides an atmosphere containing only nitrogen and hydrogen. Cost of such equipment was high, running approximately $100,000 for apparatus to supply 15,000 cubic feet per hour.

A nonferrous session was featured by a paper, by L. W. Kempf, Aluminum Co. of America, Cleveland, on age hardening of castings. Using the binary alloys for illustration, he described fundamentals of the process in terms of structural and property changes and then described modifications required for application to commercial materials. He discussed some casting alloys in commercial use and enumerated factors of most importance in commercial application of the age hardening process.

Discussion brought up the effect of strain on precipitation hardening. The reply was that it increases the effect, especially such an operation as cold working on wrought materials. Dr. C. H. Lorig, Battelle Memorial institute, Columbus, O., pointed out that in ferrous materials—copper-steel, for example—best physical properties are developed on heat treatment and, consequently, precipitation treatment for hardness is easier to obtain. He also stated a small amount of tin, on the order of 0.2 per cent, inhibits precipitation hardness of copper-steel.

In reply to an inquiry it was stated corrosion resistance varies with the alloy and the type of age hardening treatment. All factors must be considered and selection made as to whether a straight precipitation or solution-precipitation method will give desired results. Another question was whether a visible precipitate under the microscope is an indication that age hardening has been accomplished. In general, was the reply, best properties are obtained before visible precipitation has occurred.

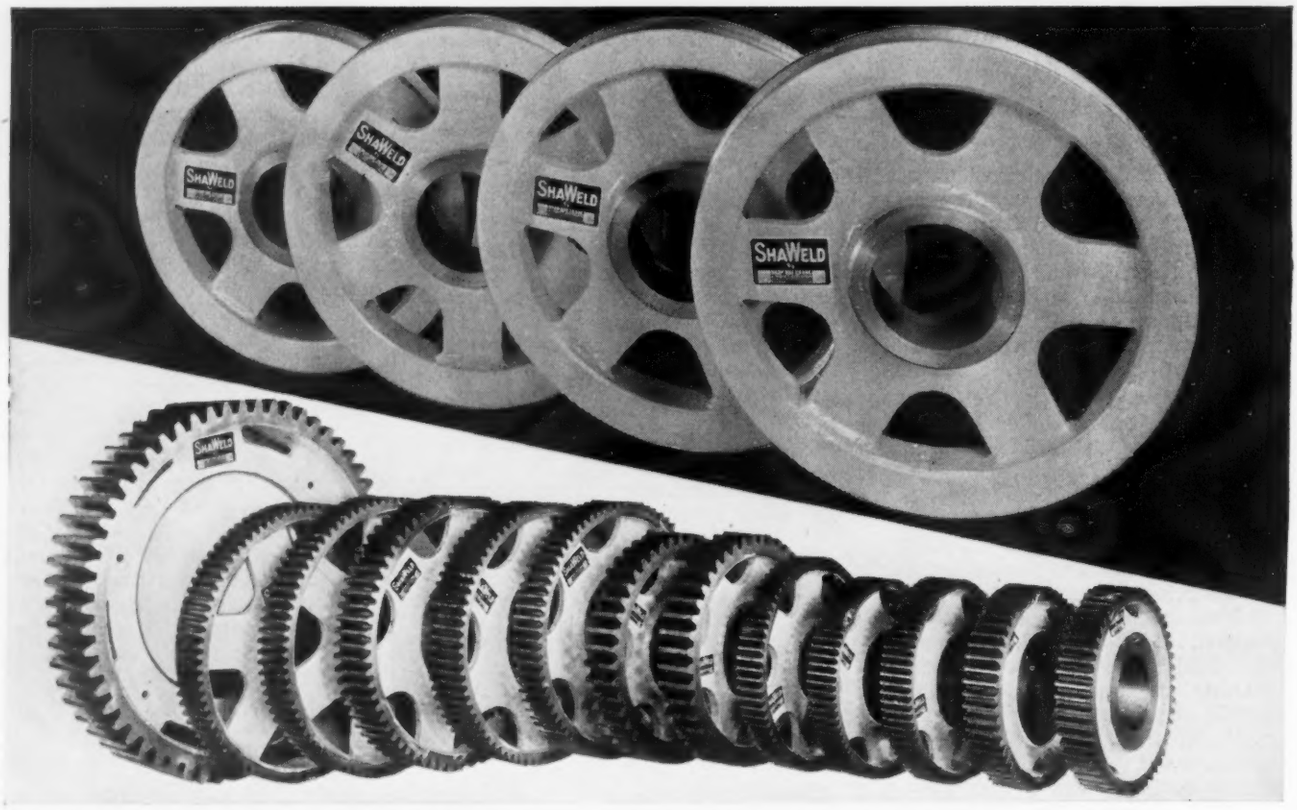
High conductivity copper castings with relatively high strength were the subject of a paper by A. B. Kinzel, Union Carbide & Carbon Research Laboratories Inc., New York. While chromium can be added to copper to provide good conductivity with reasonable strength, much better results are obtained with addition of a third element such as silicon or beryllium. One composition contains 0.08 per cent silicon and 0.80 per cent chromium. For best results this alloy is heat treated two hours at 1742 degrees Fahr., quenched in water, reheated for one hour or more at 932 degrees Fahr. and cooled in the furnace. Result is conductivity 85 per cent, ultimate strength 52,000 pounds per square inch and elongation 18 per cent in two inches. Mr. Kinzel also described alloys containing nickel and cobalt and silicon and chromium-copper with additions of silver, cadmium and tin. He discussed melting procedure for the copper-chromium-silicon or beryllium alloys and gave information on molding practice. He mentioned applications of alloy castings discussed.

In discussion O. V. Miller, P. R. Mallory & Co., Indianapolis, warned too much silicon in alloys causes trouble. He said constant properties of alloys permit pouring in a wide range of section thicknesses without difficulties. Mr. Kinzel said that while intergranular embrittlement is possible through oxidation during melting ordinary care makes such damage unlikely. E. R. Darby said copper-chromium-silicon alloy should be melted and poured as quickly as possible. Addition of 0.08 to 0.09 per cent phosphorus, he said, aids fluidity and counteracts effects of iron. Since excess phosphorus decreases conductivity such additions should be made with care.

Transformation Rates Discussed

"Transformation Rates of Austenite in Cast Iron" was the title of a paper prepared by Prof. W. P. Wood, Dr. D. W. Murphy and C. D. D'Amico, University of Michigan, and presented by Dr. Murphy. Austenitic matrix of cast iron on cooling from a temperature above the critical, it was concluded, shows same type of behavior as illustrated by the S-curve for steel. Results indicate probability that a cooling rate in a given casting and the position of the S-curve for the given iron will determine to considerable degree the matrix structure and physical properties such as hard-

(*Please turn to Page* 62)



● *ShaWeld gear blanks, finished gears and sheaves of various sizes fabricated by Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc., Muskegon, Mich.*

WHY BUILD GEARS AND SHEAVES BY WELDING?

Here's the answer of one manufacturer:

1. COST IS LOW. Savings of 10% to 25% over former methods of construction.

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3. DELIVERY IS QUICK. Blanks such as illustrated above can be produced in a few days. Also, because of uniformity of metal, fast cutting speeds can be employed.

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MR. A. L. EATON, *Gen. Supt., Treadwell Construction Co., Midland, Pa., says—*

"Since the introduction of electric arc welding in our plant we have increased the efficiency of production materially."

Maintenance Reduced

Use of modern hard-surfacing alloys affords significant economies through reduced wear. Typical examples are given with recommendations for best procedure

■ BETTER understanding of hard surfacing materials and methods of application has resulted in reducing maintenance on many different types of equipment. Such items as shafts, bushings, screw conveyor flights and even belt clips and rivets have been found to give greatly increased service when protected with alloys especially designed for resistance to wear and abrasion.

Shaft bearings are usually protected by a removable hard-faced sleeve. Although it is possible to hard face a solid shaft, it is not recommended as hard facing a removable sleeve is much more economical and there is less possibility of warpage.

A conveyor shaft sleeve to be hard faced is left at least ¼-inch undersize in bore diameter to take care of finish machining after welding. Sleeve then is preheated to between 900 and 1200 degrees Fahr. If the section to be hard faced is longer than 2 inches, it should be hard faced by welding in beads lengthwise along the shaft.

Some welding operators use the "staggered bead" method which involves turning the sleeve after each

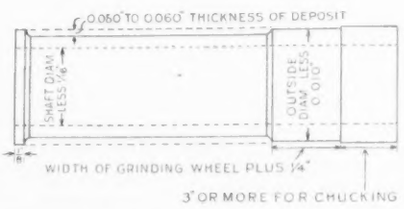

0.060" TO 0.060" THICKNESS OF DEPOSIT
SHAFT DIAM. LESS 1/16"
OUTSIDE DIAM. LESS C OTO
WIDTH OF GRINDING WHEEL PLUS ¼"
3" OR MORE FOR CHUCKING

Fig. 1—Sketch shows mild steel bushing prepared for hard facing, indicating where alloy is to be applied. Illustrations courtesy Haynes Stellite Co., New York

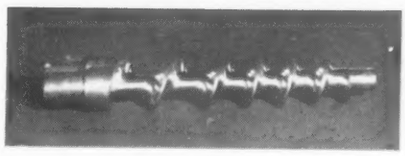


Fig. 2—Conveyor screw with hard-faced alloy applied to the flights on the discharge end

longitudinal bead and applying the next bead along a line 90 to 180 degrees away from the one just finished until the entire surface is covered. Other welding operators prefer to run each longitudinal bead next to the previously deposited one, progressing steadily around the sleeve. In either method, after hard facing is completed, sleeve is reheated to about 1000 or 1200 degrees Fahr. in a furnace no hotter than the desired temperature. Then it is allowed to cool slowly in the air, away from drafts.

Finish By Grinding

Finishing of the alloy deposit is accomplished by grinding, generally using a coolant. This is done on a suitable grinding machine or in an ordinary lathe with a tool post grinder. A medium-soft vitrified wheel of between 46 and 60 grain should be used at a peripheral speed between 2800 and 4200 surface feet per minute. In one case where a shaft operated in a special rubber bearing, a hard-faced sleeve was used without any finishing, the alloy having been applied very smoothly under the flame.

The method just described has also been in use for several years for protecting bearing surfaces of centrifugal pump shafts. Several leading pump manufacturers now furnish their equipment with removable hard-faced shaft sleeves. Experience of a number of oil refineries, sugar refineries and chemical plants indicates it is an economical method of prolonging shaft life. At one company, shafts protected by hard-facing alloy lasted six weeks in the same service where plain steel shafts lasted but one week.

Half bushings are sometimes used on conveyor shaft bearings. These bushings can be made from rolled and formed, or cast wear-resistant alloy, or of hard-faced steel. Journal boxes with removable caps are sometimes hard faced only on one

Fig. 3—The extreme ends of these special ash and coal conveyor screws are all hard surfaced

half, especially if the full weight of a heavy shaft rests on one half of the bearing. In such a case, the box or cap—depending on which is subject to the most wear—is recessed about ⅛-inch deep over all its bearing surface, except for a ¼ to ½-inch wide strip of stock left on each end of the bearing.

If a solid alloy bushing is used,

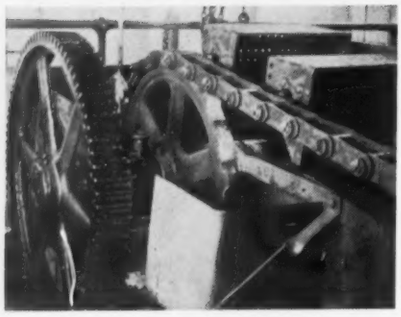


Fig. 4—Hard surfacing increased life of sprocket teeth on these beet elevators

such a shoulder keeps the bushing in place. If the bushing is hard faced, the shoulder limits flow of molten hard-facing alloy and allows a minimum of alloy to be used. In service, the steel shoulder wears more rapidly than the hard-facing alloy. As shoulder area is almost insignificant in proportion to total bearing surface, it increases only slightly the load the bearing will carry.

In connection with loads on hard-faced bearings, however, attention is called to the fact that no greater load should be placed on the hard-faced area than can be withstood by the steel under the surfacing. If a load much greater than normal is to be applied, the steel should be hardened beforehand to increase its resistance to compression.

Oil grooves can be made in the hard-faced area by grooving the alloy surface with a cutting-off wheel. If oil holes are required in center of bearing for lubrication the steel should be drilled before hard-facing and a carbon or graphite rod placed in the hole with a drive fit. Hard-facing alloy then is applied around the rod and upon removal of this

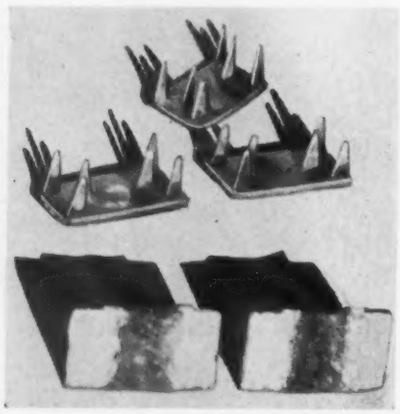


Fig. 5—Hard-surfaced clips like these last indefinitely on ore belts

plug, the hole will be properly formed. This is the only practical method of making a good clean hole in the deposit as it is almost impossible to drill the alloy, although a hole could be ground with a small, portable, electric hand grinder.

Conveyor rolls and shaft bearings in heating furnaces also can be hard faced with success. At one steel company, rolls operate at 750 degrees Fahr. and it was just about impossible to lubricate the bearings. After 30 days of service, the first bearings hard faced showed no signs of wear.

Hard facing of screw conveyor flights and bushings is a standard maintenance operation in some plants. In many cases, these conveyors are furnished, when new, with hard-faced flights and bushings. Replacing the screw in some conveyors ties up a considerable amount of operating equipment so any increase in screw life means a saving in overhead expense.

Savings Apparent

In one glass plant, each of the flights used on one furnace cost $4. The total cost of hard facing each flight was just $4. Therefore, if the hard-faced flights lasted twice as long, they would more than pay for themselves. At last report, the hard-faced flights had not been worn completely so their total saving could not be computed. However, where plain steel flights lasted from three to five weeks, hard-surfaced flights now have been operating constantly for six months.

The life of chain-type conveyors, too, can be prolonged by means of hard facing. At one plant, wear of the hard-faced teeth of conveyor chain sprockets was so slight that they still showed grinder marks on the hard alloy surface after six years' service. Officials of the plant claim that chain links which run over the sprockets have worn less in the past six years than they had worn in the three previous years. They are now considering hard facing the chain pins and links.

At one steel plant, the points of grappling tongs for raising hot ingots from the 40-inch blooming mill soaking pits are surfaced with a heat and abrasion-resistant nonferrous alloy. This is now a standard operation as tong bit inventory has been greatly reduced and time out for shutdowns has been cut to a minimum. Tong bits with hard faced points here last more than six times as long as new steel bits.

Clips and rivets on belt conveyors last practically indefinitely when protected by just a drop or two of hard-facing alloy. Ore belt clips wear out on the side where they come in contact with the pulleys. After hard facing the two ends of each clip, the superintendent of one mine believes they should last for an indefinite period as it has not been necessay thus far to remove any of the clips so treated.

A novel method developed for hard facing the heads of belt rivets is of interest. A number of rivets are placed in the holes of a perforated plate with their shanks dipping into a container of water. The tank is filled until the water level reaches to within ⅛-inch of the bottom sides of the rivet heads. Each rivet head then is covered with a drop of hard-facing alloy by the oxyacetylene process. The rivets cool quickly and require no subsequent heat treatment.

With welding equipment a standard item in every steel plant and good welding operators with full knowledge of hard facing practically

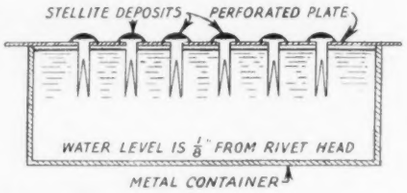


Fig. 6—Shanks of rivets are suspended in water while a drop of hard-facing alloy is applied to the heads

always within reach, no appreciable expenditure is necessary to test the process on untried applications. Only by an actual test can the best hard-facing alloy and base materials be chosen, the alloy applied in the most advantageous manner, and comparative cost data obtained on a machine part before and after hard facing.

•

Metallic Compound Stops Shrinkage in Concrete

■ According to a report recently issued by Master Builders Co., Cleveland, failures of concrete due to shrinkage may be prevented by mixing with Embeco, a metallic compound.

Experiments conducted by two construction experts of Massachusetts Institute of Technology showed shrinkage exceeding ½ per cent in setting and drying of plain cement test mixes. When the non-shrink compound was added to mixes under identical conditions, no shrinkage occurred, and in some cases there was a slight expansion.

Steel Line Lands Tuna

■ Steel finds its place even in fish stories. A record-breaking 132-pound school tuna was landed recently by Joseph Oppenheimer, 74 West Sixty-eighth street, New York. The tackle used in this catch included line and artificial bait of noncorrosive alloy steel, both products manufactured by L. B. Huntington, Baltimore. This type of steel line is said to handle on a reel almost like a linen line.

Builds Electric-Driven Soaking Pit Covers

■ DEVELOPMENT of recuperative soaking pits introduced new problems in positioning and removing pit covers, some of which are approximately 16 feet square. Earlier types of flat suspended-arch covers in welded steel frame carriages were pulled on and off the pit by a hydraulic ram. A depression or dip in the track dropped the furnace cover over the pit opening.

The hydraulic ram was superseded by a motor-driven rack and pinion, and later by a motor-operated chain drive. In all cases the dip in the track for dropping the cover resulted in shock and some sliding action. Usually the pit could be opened only in one direction. Also it was difficult to secure a tight cover seal and still maintain traction of the wheels.

Overcomes Difficulties

A recent development using separately driven mechanisms for operating the cover and for travel overcomes these difficulties. As shown in accompanying illustration the carriage is actually a special type of crane with remote control in which the travel and lighting mechanisms are fixed. Cover may be removed in either direction.

Through a series of electric relays and interlocks, the combustion system is synchronized to stop and start fuel and air supplies upon opening or closing the cover. This saves fuel, saves the cover frame, affords easier inspection of inside of pit and aids craneman during charging and drawing of a heat. The automatic electric control equipment is mounted on a panel located either on or off the carriage. Power is brought to the carriage motors by a multiconductor cable, protected so two-way cover travel is feasible. A length of cable sufficient for manipulating the carriage is carried on a reel.

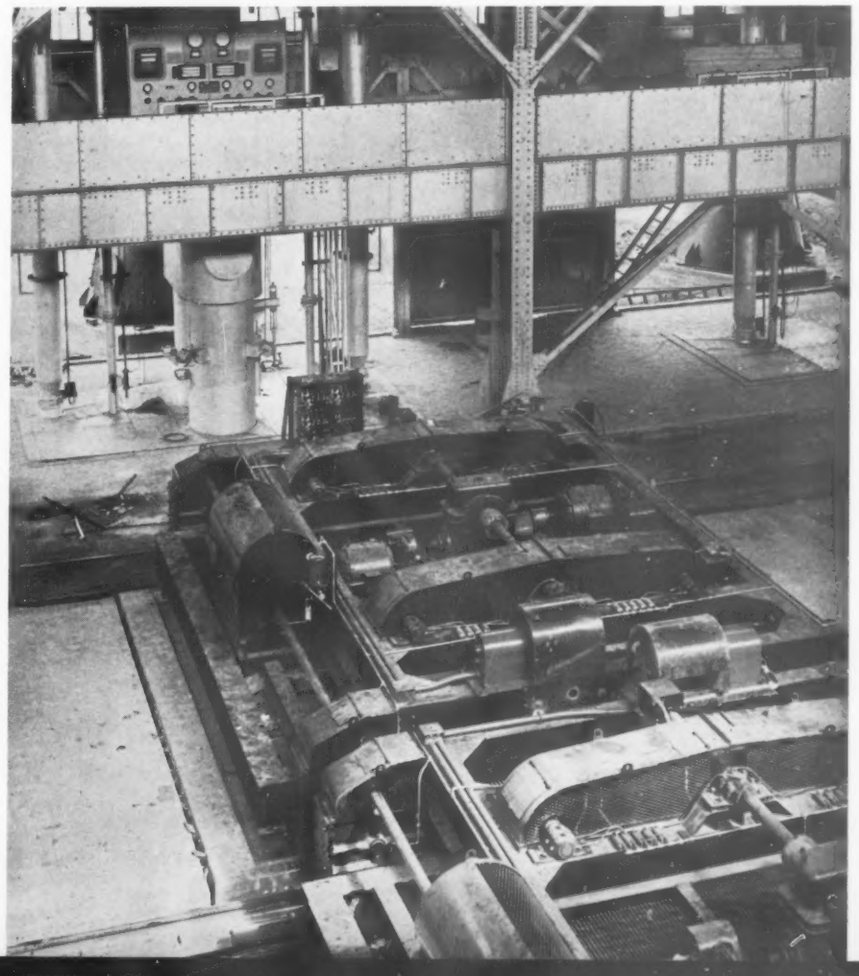
Lifting and traversing motions are accomplished by separate electric motors, suitably geared to provide the desired speeds without shock to refractories or frame and controlled through a relay from a single remote control station.

A magnetic brake on the traverse motor, actuated by track-type limit switches, spots the cover carriage on pit centerline. Switches also limit carriage travel in both directions. A similar brake on the hoist motor stops and holds the lifting mechanism at all times except when the hoist motor is energized. Remote control is provided.

Charging floor arrangement is improved by a protected low rail construction which shields rails from heat. When cover is moved, the open pit is free of obstructions. The combination has helped to eliminate warped tracks and bent cover frames and facilitates handling of ingots in and out of the pit.

Vertical position of the cover, relative to carriage and pit, is adjustable. Cover can be detached readily for repairs or when a single carriage is used for a series of pits. A spare cover can be used to avoid loss of time during the repair or replacing of refractories or other parts.

Because cover is insulated, no special precautions are required to kep oil and drive units cool, according to the manufacturer. Also, when pit is opened, wheel bearings are not in a high-temperature zone nor in the path of flames, due to the low rail construction. An insulating barrier protects the driving mechanism when the pit is open.



Recent installation under construction with electric panel mounted on carriage and general pit instrument board on upper level. Photo courtesy Amsler-Morton Co., Pittsburgh

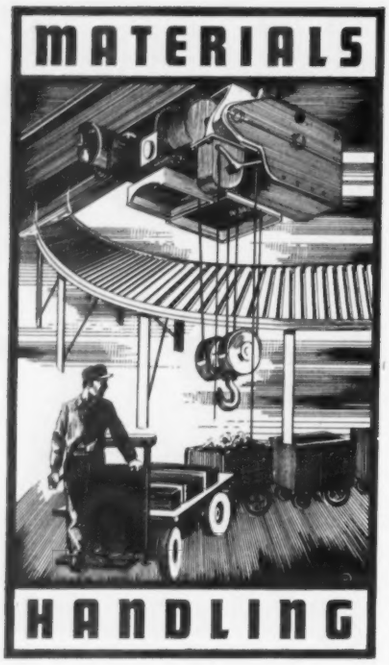
Reports on Alloying Of Tin and Bismuth

■ A fresh determination of the equilibrium diagram of tin and bismuth made by A. C. Davidson has been issued by International Tin Research and Development council as technical publication A77. Report of research includes a list of varied values found for eutectic temperature and composition and for the solid solubility of bismuth in tin. Copies may be obtained from the council, 149 Broadway, New York.

Coupling Principle Used With Low-Power Machine

■ After a period of tests, Lovejoy Flexible Coupling Co., 2009 West Lake street, Chicago, has announced application of its coupling principle to oil burners, refrigerators, washing machines and similar equipment where load is not in excess of ¼-horsepower.

Couple carries power by means of metal jaws keyed to the driven and drive shafts, between which is interposed a resilient cushion. Lubrication is unnecessary, as there is no metal-to-metal contact. Couplings automatically absorb shock, overload, torque and other stresses.



Multiple Drives

Chain conveyor is driven at four points using Selsyn control. Permits standard chain and conveyor units to be used on 3700-foot line handling 85 tons of material each day

By M. C. DANNECKER
Planning Department
General Electric Co.
Schenectady, N. Y.

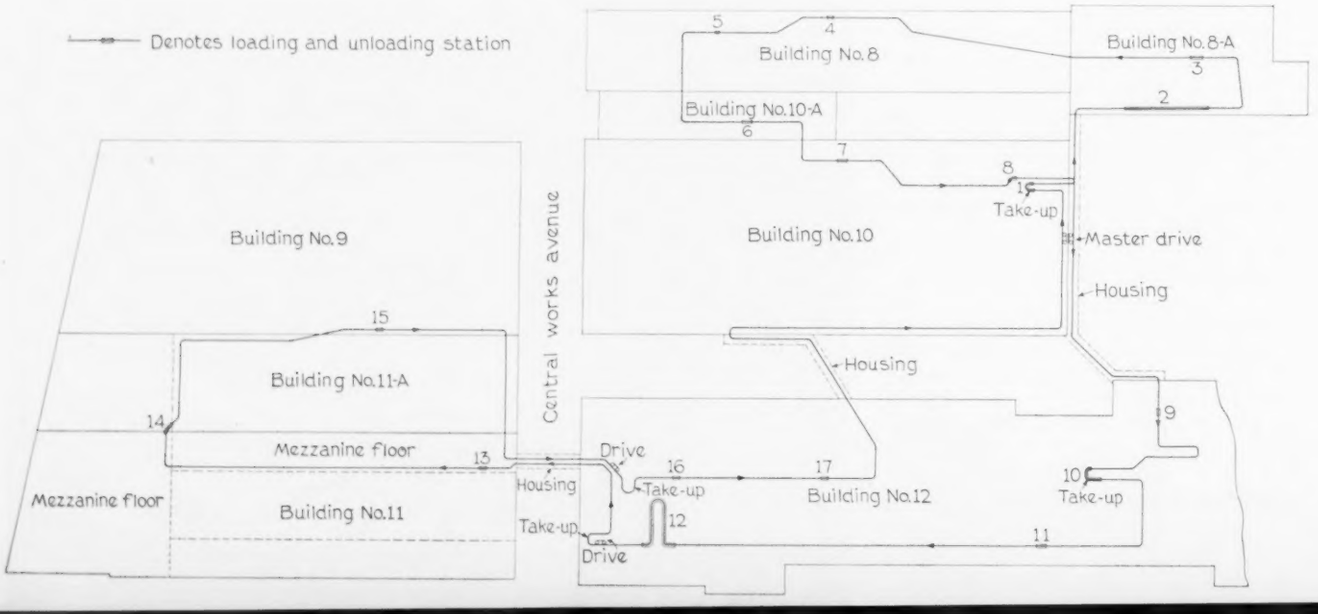
■ DURING the twelve years from 1926 to 1938 the General Electric refrigerator department in Schenectady, N. Y., has expanded from a single 3-story building until at present it occupies 15 buildings spread over a ground area of approximately 12 acres. The major portion of manufacturing activity is centered in eight buildings on opposite sides of the central Works avenue. During the early years of expansion material distribution throughout the department though efficient in some situations was handled largely by methods which permitted a certain amount of congestion, retracing of material routes, delays in schedule, spoilage of material due to rough handling and exposure to weather, and excessive maintenance and replacement of equipment.

An overhead chain conveyor was installed in 1930, and although it has been rerouted from time to time to conform with changes in manufacturing methods and models of refrigerator units, it still retains the primary advantages of decreased handling cost, reduced spoilage, saving in floor space and reduced inventories. The original installation resulted in the release of 140 trailers, one tractor and one electric lift truck for use elsewhere in the plant. By eliminating the use of this equipment, congestion from trucking within the buildings, on the Works avenue and in courtyards has been relieved.

Because of increased speed and uniform flow of material and its storage on the conveyor, the buffer storages before and after the lines of processing have been reduced. This releases floor space that can be used for manufacturing purposes and at the same time reduces inventory.

The conveyor is approximately 3700 feet long and serves 17 stations in eight buildings as indicated in Fig. 1. At the normal speed of 26 feet per minute, 2 hours and 20 minutes are required to complete one cycle. About 85 tons of material are handled per day, ranging in size from small pieces of copper tubing to the completed refrigerator unit. Several different types of hooks have been developed for the various parts that are handled. These are spaced over the entire length of chain so that there is a uniform

Fig. 1—Path of conveyor for handling various parts between buildings



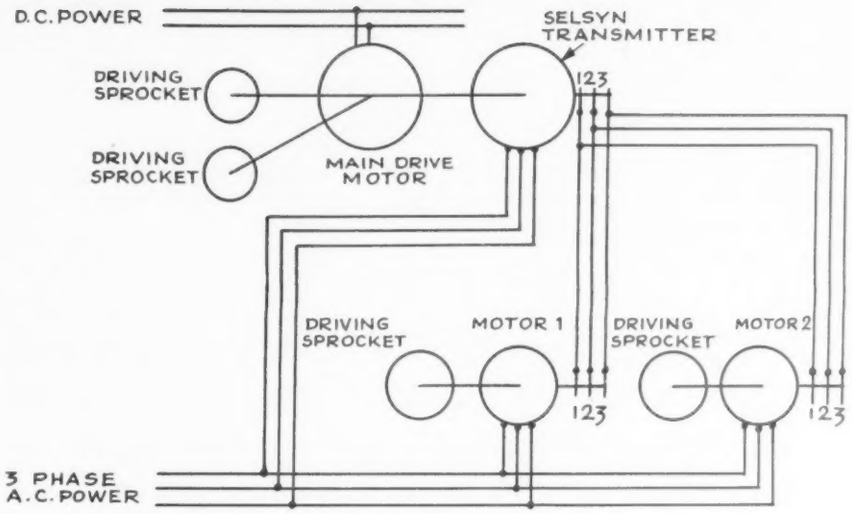


Fig. 2—Wiring diagram of the Selsyn control system used to co-ordinate the four drives

flow of the required number and types of hooks at each station.

In order to protect the conveyor and the material from exposure to the weather, there are dust-proof enclosures between buildings. These housings are lined with insulating board and equipped with steam radiators so the temperature inside is the same as that in the buildings. Approximately 90 per cent of the former method's spoilage losses, due to rough handling and rust, has been eliminated.

Loaded by Checker

In order to describe the path and function of the conveyor, the master drive at the rear of building 10 may be taken as a starting point. See Fig. 1. Compressor shells are loaded by a checker at station 1 and unloaded at station 2 in building 8-A ahead of the compressor-shell and fin assembly section. After the fins have been assembled to the shell and the entire assembly dipped in paint and baked, they are loaded on the conveyor at station 3 by a checker. Then they are delivered to station 15 in building 9. The same type of carrier hook, rubber-covered to prevent injury to the machined edge of the shells, is used in both instances.

Material trays containing floats are loaded at station 4 and tote boxes containing float valve shells are loaded at station 5 in building 8 for delivery to station 14 on the mezzanine floor of building 11. Partially completed evaporators are placed on rubber-protected hooks at station 6 by the submerge-test operator. These are removed at station 7 in building 10 by a checker, who places them on a gravity conveyor for further processing.

The finished evaporators are loaded at station 8 by the final checker and removed at station 9 in building 12 for bumper storage, or at station 10 where they are used in the final unit assembly. Stations 12 and 16 serve as bumper storage areas for parts which are produced more economically on schedules other than on the assembly line. Float valves are loaded at station 14 on the mezzanine floor of building 11, for delivery to station 10 in building 12. Trays containing copper tubing are also loaded at this point for distribution along the course.

The completed compressor unit assembly is loaded at station 15 in building 9 and removed at station 17 in building 12, at the start of the final unit assembly line. No operations are performed at any point along the path of the conveyor, as its function is purely that of transportation. The speed can be changed only under supervision of the production department, which regulates it to match the production rate of the assembly lines.

Selsyn control is utilized for multiple drives. The conveyor is driven by four caterpillar drives, two of which, at the rear of building 10 (master drive, Fig. 1), are mounted on one frame and are driven by a direct-current motor through speed reducers and gearing, thereby being co-ordinated mechanically.

This motor also drives a Selsyn transmitter which controls the speed of slip-ring induction motors on each of the other two drives, located in the front of building 12 (Fig. 1). This method of control is made possible by allowing excess chain between all drives. A take-up is provided after each drive to keep proper tension on the chain. Excitation is maintained after the power is cut off the driving unit so that all drives coast to rest, keeping in exact synchronism.

Length is Advantage

The advantage of using multiple drives lies in the ability to construct a conveyor of extreme length, using standard chain and trolley equipment commonly used for conveyors of short length. This is accomplished by locating the drives so the chain pull at any one drive is within the limits of good design for conveyors of ordinary length.

The advantage of Selsyn control for the speed of the several drives lies in the simplicity of changing the conveyor speed, simply by controlling the speed of the direct-current motor of the main drive. Fig. 2 is a wiring diagram of this control.

The driving sprocket of each drive

(*Please turn to Page* 57)

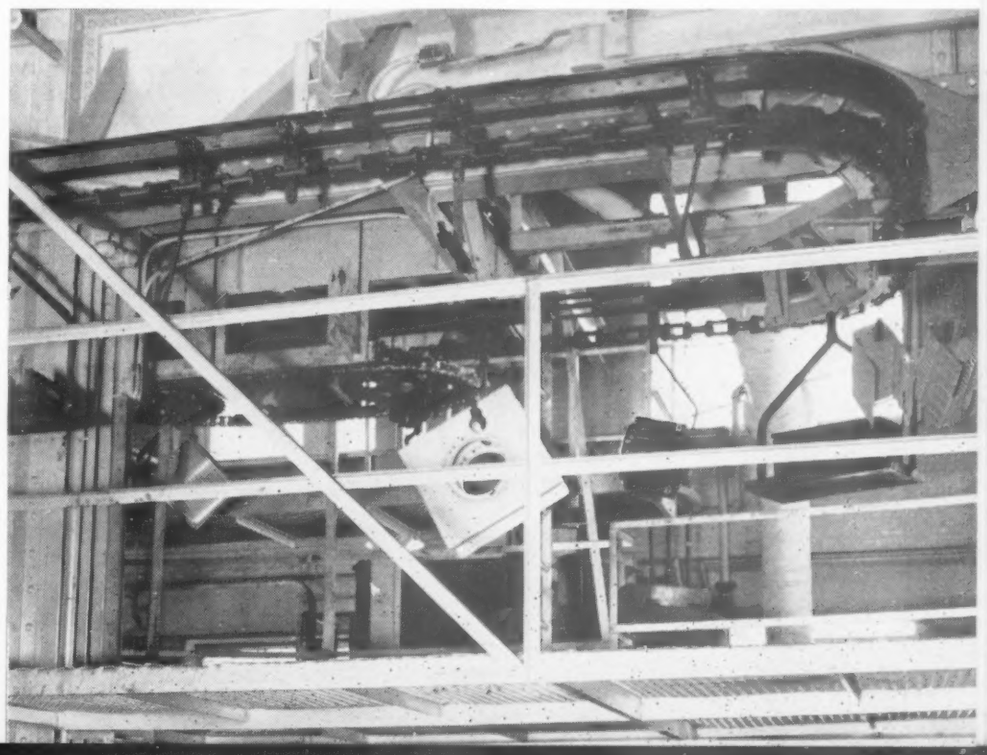
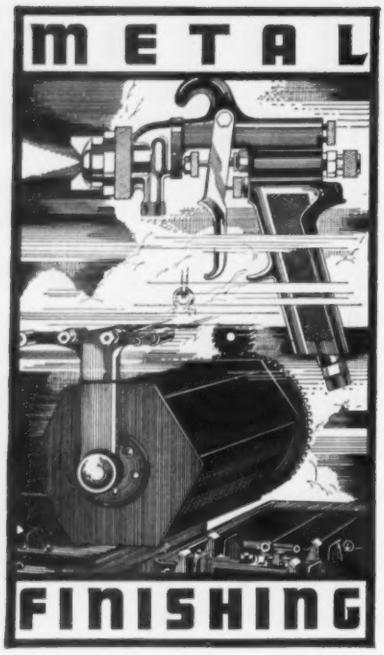


Fig. 3—One of two main drives in building 12, showing sprockets, take-up and part of the load handled



Galvanizing Settings

Distributing heat to meet load demands eliminates hot spots, increases vessel life, lowers fuel costs, reduces dross. Radiant-tube heating aids galvanizing

By F. F. SCHLITT
Lee Wilson Engineering Co.
Cleveland

■ MATERIALS galvanized vary in size, shape and analysis. Bath composition also varies with type of coating desired. For every combination of these two variables, there is a critical temperature at which proper results are obtained. To obtain a product of uniformly high quality, it is not only necessary that work be prepared properly and bath ingredients be correct, but also bath temperature must be held at the critical point. This temperature must be maintained in all parts of the bath through which the product travels.

Where the product enters at one end of vessel and is removed at other end, it is essential that more heat be added at the entering end than at the exit end. In this case, change in rate of heat transfer should be uniform from end to end.

Greatest heat loss is at surface of zinc. In many instances, work passes through upper half of spelter only. To compensate for these unequal heat demands, most of the heat should be applied to upper part of vessel.

Another beneficial effect of adding more heat to upper part of vessel is that metal in lower part is less agitated by convection currents. Consequently it is easier for dross to settle to bottom. With less dross in suspension in working zone, cleaner products are obtained.

Important zinc losses are dross and zinc ash. By controlling bath temperature within close limits, periods of overheating are eliminated and less zinc ash is formed at surface. Formation of dross increases rapidly as temperature at contact surfaces between spelter and iron is raised. Localized or spot heating of a vessel can be avoided by controlled heat distribution along sides of vessel. In vessels used for pipe, heat input to sides of vessel should be the same at all points in a horizontal plane as shown by shading in Fig. 1. In vessels where it is necessary to add more heat at the end where work enters bath, heat input to sides should be changed gradually from end to end as shown by shading in Fig. 2.

By having each square foot of vessel side transmit proper amount of heat, it is possible to avoid localized high temperature areas. As a result, action of zinc on kettle wall is decreased to a marked degree

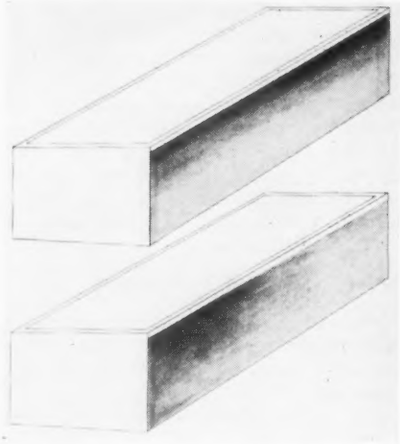


Fig. 1, above, shows heat distribution increasing to top. Fig. 2, below, shows it increasing from end to end

Abstract from paper delivered at 20th Annual Meeting, American Zinc Institute Inc., St. Louis, Mo.

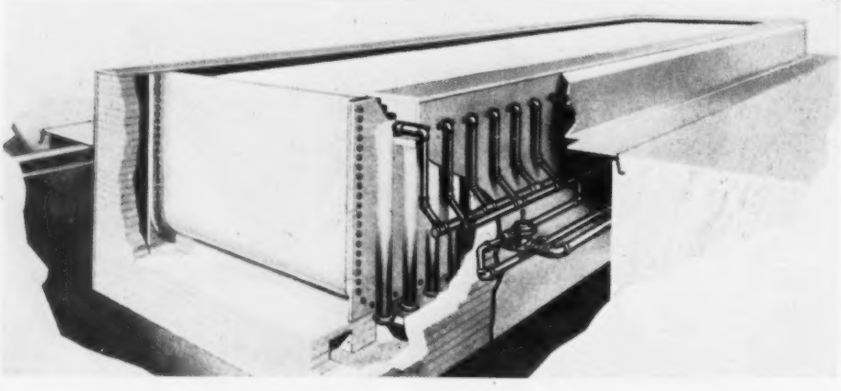
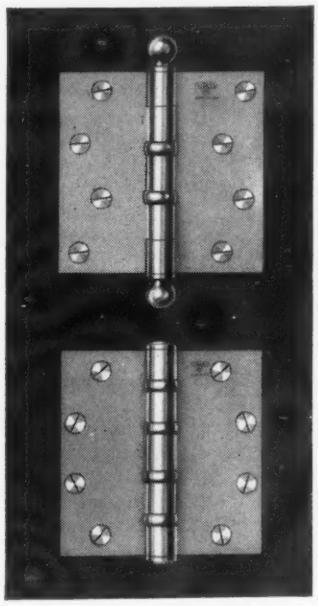


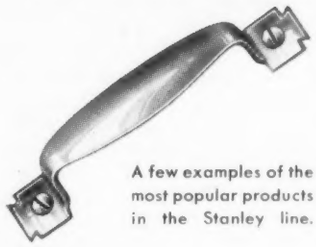
Fig. 3—Cutaway view of radiant tubes used to heat galvanizing pot

A METAL CLEANING PROBLEM AND ITS *Low Cost* ANSWER

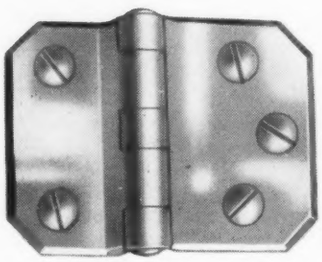
ORTHOSIL*

TRADE MARK





A few examples of the most popular products in the Stanley line.



"Stanley" is a name that means fine hardware to millions of people. Products such as these must not only give years of service, but must retain their excellence of finish indoors or out. The Stanley Works have found that the metal cleaning operation prior to plating goes a long way to determine the durability and beauty of the finish.

How can cleaning best be handled, at lowest cost? Here is the experience of The Stanley Works: "We have found Orthosil particularly valuable in the cleaning and preparation of steel, iron, and cast iron goods for plating operations. We use a hot Orthosil solution with reverse current in our electrocleaner bath, followed by an acid dip and rinse. Cast iron, especially, responds to this type of treatment, and on some articles we have found it the most satisfactory method."

Orthosil, one of the Pennsalt Cleaner line, is used by leading manufacturers in all parts of the country. Almost without exception, it has materially reduced the cost of heavy duty metal cleaning. Why not check its advantages in your own plant? Write us for details — address Department F.

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*Particularly effective in electrolytic cleaning due to its high conductivity • Assures quicker action than other alkalis • Prevents grease and dirt from re-depositing • Easy to pour, quick to dissolve • Dry—highly concentrated—economical • Quickly removes the grease, soot, dust, and various other kinds of dirt unaffected by pickling acid • Leaves material clean for further processing.

PENNSYLVANIA SALT MANUFACTURING COMPANY *Chemicals*

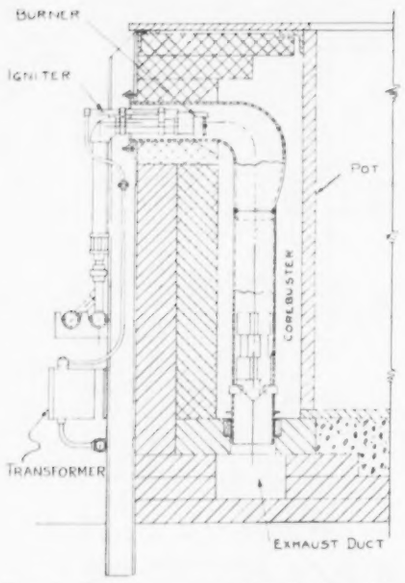


Fig. 4—Cross section of radiant tube and auxiliary equipment

with less dross and longer vessel life.

As in any furnace lowest fuel consumption is obtained when correct gas-air ratio is maintained over range of turndown necessary when products of combustion leave furnace at a temperature close to temperature of objects being heated and when heat losses from setting are at a minimum.

Fig. 3 is a cutaway view of a vertical radiant-tube galvanizing furnace. Tubes along sides of vessel have high-pressure inspirator-type burners inserted in top elbows. Flues are beneath exhaust end of tube. Double manifolds permit half of tubes to be turned off during holding periods.

Fig. 4 shows top elbow, cast from a 25 per cent chromium, 12 per cent nickel alloy, welded to bottom section made from a rolled sheet of the same alloy. For convenience in lighting up electric igniters, attached to burners in upper part of tube, are used.

Setting is lined with light refractories. Two top courses are Superex blocks; side walls contain 4½ inches of insulating brick on inside, backed up by 4½ inches of fire brick. It is possible to use this type of lining because all combustion takes place inside the tubes. Consequently, hot gases do not come into contact with either vessel or lining. Heat storage capacity of this type of lining is about one-fourth conventional amount. Also, lining is not exposed to flame temperatures so refractories in side walls of a radiant tube setting store only about 20 per cent as much heat as a direct-fired setting.

The lining which stores smallest amount of heat allows bath to respond more quickly to a change in rate of combustion. Thus, automatic temperature control is able to hold bath temperature within extremely close limits, facilitating high quality galvanizing.

With a blast type burner, most of the combustion takes place in elbow at top of tube so most of the heat is released from this elbow to upper part of vessel, thus fulfilling another requirement of a good galvanizing setting.

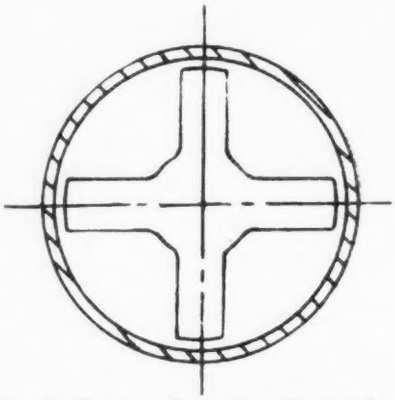


Fig. 5—Section through radiant tube showing core buster in place

Since in some vessels it is necessary to add more heat to one end of vessel than to the other, proper design and spacing of the tubes easily meets this demand.

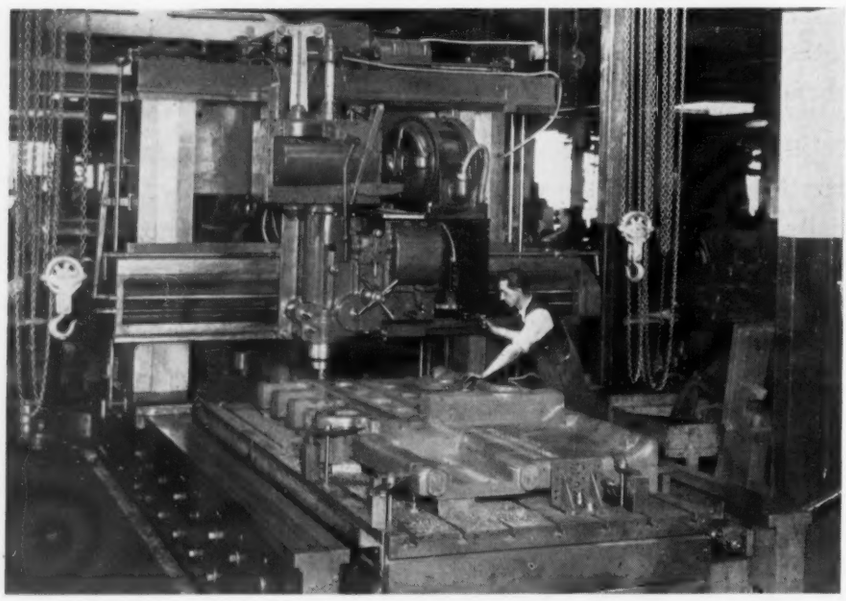
Surface of vessel between adjacent tubes receives direct radiant heat from both tubes and also reflected heat from refractories in side walls so heat can be distributed evenly in a horizontal plane or can be changed gradually from end to end without any localized hot spots. This method of eliminating hot spots in vessel wall reduces zinc losses due to drossing and a longer vessel life results.

Contains Core Busters

Vertical fabricated section of tube contains winged refractories, known as core busters, supported near bottom of tube by alloy pins. They conserve fuel in two ways. They are heated by products of combustion and transfer this heat to tube by radiation. They also increase velocity of products of combustion and cause turbulent flow. Since gases in turbulent flow transfer their heat to surrounding surfaces much more rapidly than gases in parallel flow, core busters increase the efficiency of combustion as much as 15 per cent in some cases.

A light insulating lining is used for close control of bath temperature and to reduce effectively heat lost through walls. At bottom of tube, where it passes into flue, a seal of soft heat-resisting material prevents air from being drawn into tube chamber and out through flues. Thus, core busters, furnace linings and seals combine to produce low fuel consumption.

It Features A Fast Finish



■ **This special milling machine, designed and built by Sleeper & Hartley Inc., Worcester, Mass., is used by this company in its own plant to finish large castings such as the one shown. It will completely finish a casting in about one third the time required by a planer. Photo courtesy American Gas Association, New York**

British Delegation Will Attend Third Porcelain Enamel Forum

■ A MOST comprehensive program has been arranged by the Porcelain Enamel institute for its third annual forum at the University of Illinois, Urbana, Ill., Oct. 12-14. Twenty-two technical papers on various phases of enameling practice will be presented at four general technical sessions and three group discussions devoted to hollow ware, cast iron and sheet iron.

An international flavor will be given the forum through attendance and participation of a group of members of the Institute of Vitreous Enamelers of England. Papers which are to be presented will afford an excellent comparison of American and British practice. The dinner to be served in connection with the forum will honor the overseas visitors.

Will Inspect Plants

The British delegation will spend ten days in the United States, visiting eight cities and inspecting 13 plants. A plane has been chartered to convey the party from city to city. The itinerary and plants to be visited are as follows:

Oct. 8, arrival in New York; Oct. 9, Washington; Oct. 10, Porcelain Enamel & Mfg. Co. and Baltimore Enamel & Novelty Co., Baltimore; Oct. 11, Irwin works, Carnegie-Illinois Steel Corp., Clairton, Pa., and Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; Oct. 12, American Rolling Mill Co., Middletown, O.; Oct. 13-14, Porcelain Enamel institute forum, Urbana, Ill.; Oct. 15, Chicago Vitreous Enamel Product Co., Chicago; Oct. 17, Norge Corp., Muskegon, Mich., Ford Motor Co., Dearborn, Mich., and Briggs Mfg. Co., Detroit; Oct. 18, Ferro Enamel Corp. and strip mill, Republic Steel Corp., Cleveland; Oct. 19, return to New York via Niagara Falls.

The detailed program for the Porcelain Enamel institute forum is as follows:

Wednesday, Oct. 12

AFTERNOON

Address of welcome, by Dean M. L. Enger, University of Illinois, Urbana, Ill.

Response, by F. E. Hodek Jr., General Porcelain Enameling & Mfg. Co., Chicago, and president of the institute.

"Review of the Industry," by Emerson P. Poste, consulting engineer, Chattanooga, Tenn.

"The Institute and the Plant Man," by Charles S. Pearce, secretary, Porcelain Enamel institute, Chicago.

EVENING

Lighting exhibit and address, by Prof. J. O. Kroehenbuehl, University of Illinois, Urbana, Ill.

Meeting of technical research committee, Urbana-Lincoln hotel.

Thursday, Oct. 13

MORNING

"Tentative Tests for Abrasion Resistance," by W. N. Harrison, national bureau of standards, Washington.

"Chipping Resistance of Enamels," by Paul L. Smith, research fellow, Porcelain Enamel institute, national bureau of standards, Washington.

"Factors Affecting Sag Resistance Properties of Enameling Iron," by Frank R. Porter, Inland Steel Co., Chicago.

"Methods of Testing Enameling Stock," by W. A. Alexander, Frigidaire division, General Motors Corp., Dayton, O.

AFTERNOON

"British Enameling Practice," by A. England, Blythe Colour Works Ltd., England.

"One Cover Coat Ware," by E. C. Aydelotte, Benjamin Electric Mfg. Co., Desplaines, Ill.

"Ball Milling Practice," by A. H. Burnham Jr., Locke Insulator Corp., Baltimore, and H. Sechrist, Vitreous Steel Products Co., Napponee, Ind.

"Sources of Enamel Shop Waste," by W. F. Findlay, Findlay's Ltd., Canada.

EVENING

Dinner and entertainment, Urbana-Lincoln hotel. Speaker: Bennett Chapple, American Rolling Mill Co., Middletown, O. Subject: "New Frontiers."

Friday, Oct. 14

MORNING

Hollow Ware

"Black Specking of Hollow Ware," by E. C. Dexheimer, National Enameling & Stamping Co., Granite City, Ill.

"Fabrication and Trimming," by W. V. Jared, United States Stamping Co., Moundsville, W. Va.

Cast Iron

"Problems in Milling and Application of Dry Process Enamels," by Ralph Fry and Frank J. Zvanut, Ferro Enamel Corp., Cleveland.

"Automatic Blasting," by E. B. Rich, American Foundry Equipment Co., Mishawaka, Ind.

"Some Observations on Dry Process Enameling," by E. E. Howe, Chicago Vitreous Enamel Product Co., Cicero, Ill.

Sheet Iron

"Color Matching of White Parts," by G. H. McIntyre, Ferro Enamel Corp., Cleveland.

"Circulating Ground Coat Systems," by Ray Harner, Tennessee Stove Works, Chattanooga, Tenn.

"Burning Tools for Enameling," by D. W. Talbott, Ohio Steel Foundry Co., Lima, O.

AFTERNOON

"Automatic Spraying and Brushing Equipment," by J. F. Roche Jr., Binks Mfg. Co., Chicago.

"Flash and Roll Seam Weld Assembly for Enameling," by C. G. Bassler, Taylor-Winfield Corp., Detroit.

"Relationship of Some Welding Practices with Certain Enamel Defects," by J. J. Canfield and Alva Taylor, American Rolling Mill Co., Middletown, O.

"Comparisons of English and American Enameling Plants," by C. P. Stone, Ferramic Industries Ltd., England.

"Forum Plans for 1939," by F. E. Hodek Jr., General Porcelain Enameling & Mfg. Co., Chicago.

Discusses Enamel Storage

■ Porcelain Enamel & Mfg. Co., Baltimore, has issued a booklet on enamel storage, prepared by H. G. Wolfram, manager of technical operations. Effect of temperature on enamel in storage is discussed, and cooling systems for protecting enamel are described.

Upends 14,000-Pound Coils

■ **This is one of four gasoline electric trucks employed in a large tin-plate mill in handling strip between electrolytic cleaner, scales and annealing oven conveyor. With a 76-inch wheelbase, truck has five 40-inch forks, three on bottom and two on side. Bull gear and pinion tilts and turns coils over. Photo courtesy Yale & Towne Mfg. Co., Philadelphia**

Steelmakers Study The Influence of Refractories

■ REFRACTORIES division, American Ceramic society, held its annual summer meeting at Bedford Springs hotel, Bedford, Pa., September 2 and 3. "Steel Mill Pouring Pit Refractories" was subject of the technical program. Dr. Nelson Taylor, chairman of refractories division, was in general charge of the meeting. Gilbert Soler was program chairman.

Must Withstand High Heat

W. C. Kitto, open hearth superintendent, Pittsburgh Steel Co., Monessen, Pa., in presenting his paper, "Refractories for Bottom Pouring," pointed out that such refractories must withstand high temperatures and erosion by the stream of metal. In the practice described, a magnesite nozzle, 13½ inches in length with a bore of 1⅜, 1½, or 1⅝ inches, was used with a large screw type graphite stopper head. Pouring metal at 2900 degrees Fahr. places a severe strain on the stopper head and nozzle, but it is a rare occasion to lose a stopper head or have difficulty with a nozzle. Center runner brick have an inside diameter of 2⅜ inches. All other runner rick have 1½-inch holes and all outlets are 1½ inches in diameter. Steel is poured in round ingots varying from 1250 to 5500 pounds each with specifications of 0.10 to 0.50 per cent carbon, with 125 tons per heat. Ten to eighteen groups of ingots are necessary for each heat. Pouring rates are regulated so rise of metal in molds is uniform for various sizes of ingots. If pouring rates are too high or steel temperature is too high, cracked ingots result.

Runner brick are subjected to a load test of 25 pounds per square inch at 2600 degrees Fahr. If no appreciable deformation is shown, the brick are satisfactory for use regardless of chemical analysis. The brick must also be sufficiently hard burned in order to have a glazed surface, and be free from warping or cracking. The hole must be smooth and straight so a full stream will be carried to each ingot and an even rate of rise maintained in all molds of the same group.

Well fitting and tight joints are necessary in the bottom cast setup. To attain this, the plates must be well cast, with straight and level grooves so brick will be held firmly in place. Plates must be carefully and thoroughly cleaned after each pour. Brick must be set up so holes are in exact center of mold to prevent splashing or cutting of mold, and the setup should be such that joints are all under molds so they will be held tightly and will prevent the possibility of breakouts.

It was stated that a great deal of trouble attributed to refractories can be overcome by proper teeming temperatures and control of pouring practice.

Second of the five papers at this session was presented by Everett C. Hite, refractories engineer, and Edward E. Callinan, combustion engineer, Steel and Tube division, Timken Roller Bearing Co., Canton, O. In this paper, "A Study of the Factors Influencing Pouring Rates of Nozzles," pouring rates of quality steel were discussed as affecting ingot surface, ingot structure, entrapped inclusions, mold life and presence of skulls. In this investigation to determine the factors affecting pouring rates, 26 different brands of nozzles were laboratory and service tested. These nozzles were divided into two classes: general purpose nozzles which have P.C.E.'s ranging from cone 16 to 27; special nozzles which are premium nozzles for special uses and have P.C.E.'s from cone 31 to 37.

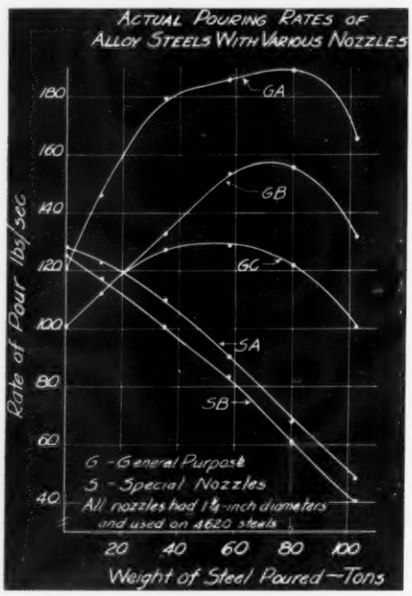


Chart compares pouring rates for two classes of nozzles

The accompanying chart shows typical pouring rate curves of these two classes. Factors producing variations in pouring rate were discussed from standpoint of theoretical laws of flow. It was concluded that a non-viscous type of flow is obtained with both classes of nozzles, being modified considerably in the case of special nozzles. Principal cause of this modification was thought to be the coefficient of contraction which a non-streamlined orifice will produce. The nozzles tested did not have streamlined orifices. Erosion of the general purpose nozzles to produce streamline flow, not found in special nozzles, explained the slower rate-of-pour characteristic of the special nozzles tested.

Consideration was given to the importance of design of special nozzles where the original orifice contour was maintained. In the case of general purpose nozzles, where the original orifice contour soon after the start of the teeming period erodes to a streamline design, the original design has little effect in controlling pouring rates. Ideal pouring rate is generally believed to be one which will be uniform throughout the entire teeming period. On the basis of these observations, it is shown that to obtain a nozzle which will most nearly approach this desired pouring rate curve, the nozzle should have a refractoriness between that of the two types discussed in this paper, and an orifice approaching a streamlined design. Final design of nozzle is further dependent upon effects produced by differences in thermal conductivity, porosity, grain size and general workmanship of the finished nozzle.

Work described in this paper was not necessarily final and was presented more or less as a progress report. However, these are thought to be fundamental concepts which should be an aid in obtaining a nozzle producing optimum pouring conditions.

Nonmetallic Inclusions Cited

"Pouring Pit Refractories as a Source of Non-Metallic Inclusions" was the third paper at this session. It was presented by Dr. D. L. McBride, research engineer, Bethlehem Steel Co., Cambria plant, Johnstown, Pa., who stated that elimination of non-metallic inclusions is one of the most vital problems facing the manufacturer of quality steels. Recent work has indicated that these inclusions can result from reaction of metal with pouring pit refractories. Positive improvements have been made, but there occasionally occurs a heat which has a tendency to be undesirably dirty, and this condition has been frequently traced to failure of the pouring pit refractories to function properly.

The tapping spout suffers serious

erosion under the heavy impact and high velocity of the metal as it leaves the furnace. As the spout is built of loam, the alternative is to use magnesia or chrome-magnesite liners to produce cleaner steel.

All of the ladle refractories may directly or indirectly act as contributory sources of non-metallic inclusions. The ladle brick, stopper rod sleeve, and nozzle are exposed to high temperature and chemical attack by the steel for approximately an hour. Amount of ladle brick eroded by the metal and slag varies between ½ to ¾ bricks per ton of steel.

Failure of sleeve brick may result in a leaking or running stopper which may increase surface scabs and oxidation of metal, as well as creating an industrial hazard. The properties of the ideal sleeve brick are resistance to thermal shock, resistance to slag and metal attack, low thermal conductivity.

High Erosion Undesirable

Excessive or non-uniform erosion of nozzles is extremely undesirable as a canted or spraying stream is produced which results in an abundance of surface or internal seams. Tests on ingots poured with a canted stream show a preponderance of seams on one or two sides of the ingot product.

There are other factors, definitely unrelated to refractories, that can cause surface or internal seams. However, evidence indicates that at times pouring pit refractories can be very important sources of inclusions.

In the following paper "A Memoir About Pouring Refractories," C. L. Kinney, Refractories engineer, Carnegie-Illinois Steel Co., South works, Chicago, dealt with steel pouring refractories as used in the manufacture of basic openhearth ingots. Attention was directed to the growth of and improvement in this process, and the premise made that steel pouring refractories have not developed concordantly and three reasons for this condition suggested.

Percentages of fire-clay eroded, per ton of ingots, was estimated, and it was submitted that more of this turns out to be inclusions in steel products than is generally conjectured.

Marked "bloating" which occurs in the best of the low-softening-temperature ladle brick was held to be important insofar as longer ladle lining service is concerned. Quantities of fire-clay eroded from these types of brick, in the lower parts of steel ladles, were estimated; and the probability that eroded fire-clay contributes to the occurrence of inclusions was considered.

High-softening-temperature, steel-ladle brick might be expected to erode less than low softening temperature; that therey the probability of inclusion occurrence would decrease and that ladle service would increase. These expectations are fulfilled only in part because of brick joint erosion, spalling and cracking. Laying this type of brick with a variety of high temperature cements did not markedly reduce brick joint failures.

A composite ladle lining of high and low softening temperature brick is considered, as is its nominal excess cost per ton of ingots, and the relation of this cost to steel conditioning cost.

The guest speaker was Dr. Walter J. Rees of the department of refractory materials, university of Sheffield, Sheffield, England. Dr. Rees concluded the program with a very interesting summary of the papers presented and compared pouring pit refractory practice of Great Britain with that of the United States.

He stated that co-operative groups comprising refractory users and refractory manufacturers were making an intensive study of pouring pit refractories in Great Britain. British practice differs from that used in the United States. Ladle brick used in Great Britain have a higher softening temperature than those used in this country. Little difficulty is encountered with refractories in pouring acid steels, but the problem of refractories in basic steel pouring practice is quite important.

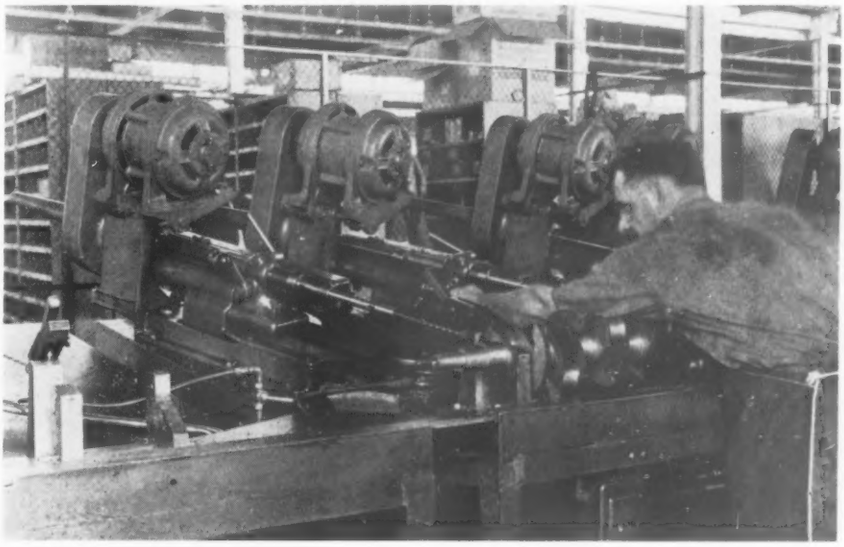
Special care must be given by steelmakers in properly assembling and drying out pouring pit refractory assemblies before use. In Great Britain the problem of porosity and permeability of refractories has been given a great deal of attention. Producing pouring pit refractories with low permeability is attended by difficulties due to spalling. Various means of producing a denser, less permeable refractory have been used, such as grading and selection of materials, grain size distribution and especially de-airing. Additions of talc and similar materials have been made in order to reduce spalling.

Dr. Rees also stated that British refractory manufacturers were making every effort to produce a uniform product with high workmanship. Tightness of joints is dependent on the straightness and uniformity of the brick used in laying up a ladle and is reflected in increased life.

Nozzles are properly designed for good seating of the stopper head. Inserts of magnesia, mullite and high alumina materials have been used but have not solved the problem of nozzle erosion.

The question of increased unit cost of refractories in order to obtain quality was discussed, and it was stated that in Great Britain steel-making costs were lowered in some cases by using refractories of higher unit cost. In other cases the quality advantages gained offset many times the increased refractory unit cost.

Drills Oil Holes Accurately



■ **Special high-production setup at Ohio Crankshaft Co.'s new Harvard avenue plant, Cleveland, drills oil holes in automotive crankshafts at high speed. Speed clamps hold crankshaft in fixtures at correct position for drilling. Spiral drills remove chips from small, deep holes produced. Each drill is driven by a separate motor. Feed is by hand**

Thrustor Valves Control Firing of Soaking Pits

■ An interesting application of thrustor-operated valves to soaking pits was made recently when a steel mill installed twelve of these control devices to govern operation of gas-firing equipment.

Soaking pits are used to heat ingots preparatory to rolling in a blooming or slabbing mill. Each pit is covered by a heavy brick-lined cover mounted on trucks and is fired alternately from opposite sides. An automatic timer operates valves and reverses firing. Valves furnish oil under pressure to hydraulic cylinders, which turn on fuel and air from one end while releasing products of combustion through other end. Firing is from one side for a definite time period, usually from 15 to 20 minutes.

Valves and thrustors are mounted on front of a steel panel, which supports also the automatic timing equipment, pressure gages and other accessories. Interlocks are used on both automatic and manual controls, so that firing from both ends at the same time cannot take place. Heating periods vary from 2 to 8 hours, depending on incoming temperature of the 4 to 5-ton ingots.

Valves, which utilize General Electric thrustors, were manufactured by Ruggles Klingemann Mfg. Co., Salem, Mass.

Determines Thickness Of Nonmagnetic Coatings

■ A nondestructive, magnetic method for measuring thickness of nonmagnetic coatings on steel is described in research paper RP1081, published by the national bureau of standards, Washington.

Instrument used is similar to that for measuring nickel coatings on nonmagnetic base metals. Because nickel is less magnetic than steel, thickness of nickel coatings on steel can be measured by this method, using a suitable calibration curve.

This method depends on decrease in magnetic attraction caused by presence of a nonmagnetic coating between a magnet and the steel base metal. Any nonmagnetic material, such as zinc, copper, enamel, or an air gap, placed between magnet and steel, decreases magnetic attraction to an extent in proportion to thickness of intervening layer. Measurement consists in bringing end of magnet into contact with coating on the steel and determining force necessay to detach magnet.

Properties of Electrode Same as Parent Metal

■ Developed exclusively for welding 4 to 6 per cent chromium steel, an electrode, known as Harchrome, a product of Harnischfeger Corp., Milwaukee, deposits weld metal which has same properties as the parent metal.

Base metal used in this electrode contains from 4 to 6 per cent chromium and 0.5 per cent molybdenum, purpose of which is to heighten its resistance to corrosion and oxidation and increase its creep strength and resistance to impact. Manufactured in sizes from ⅛ to 3/16-inch, electrode is designed for operation with currents from 80 to 200 amperes.

Tin Process Originated By American Scientists

■ A new process for coating metals with tin, known as "stannising", was described on Page 48 of the September 5 issue of STEEL as having been developed in England. This is incorrect. The process was originated by B. W. Gonser and E. E. Slowter, both of Battelle Memorial institute, Columbus, O.

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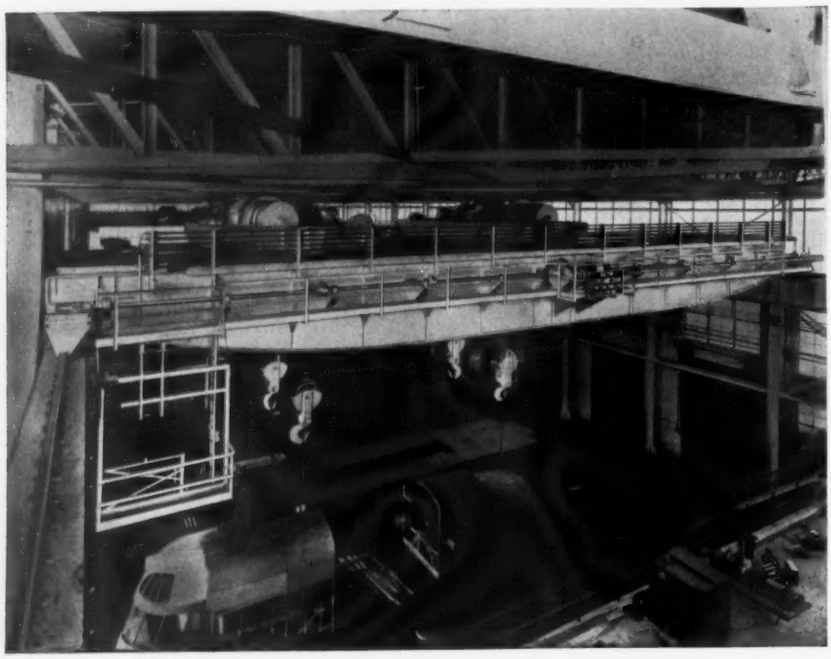
All Welded for Every Industry



• A 200 ton—100' 0" span, all welded, Cleveland Crane. This crane used in the assembly of Diesel Locomotives.

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MATERIALS HANDLING EQUIPMENT

Multiple Drives

(*Concluded from Page 49*)

is provided with a cast-iron shear pin and a mechanism to open a switch and stop the conveyor if the pin sheares due to fouling of the chain. If the excess chain between two drives should become too short, a limit switch mounted on the take-up frame will shut off the conveyor before the driving motor is pulled out of synchronism. Push buttons are located at all loading stations within easy reach so the chain can be immediately stopped in case of an emergency. At all points where the material clears the floor more than seven feet, an expanded metal guard with turned-up edges is provided to catch any material that might fall from a carrier or hook.

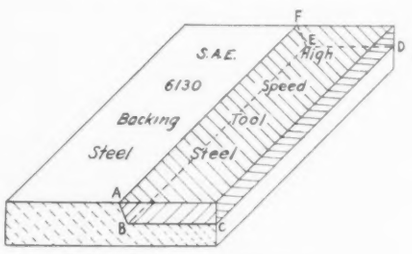
This conveyor system has proved an efficient means of handling a large quantity and variety of materials throughout a department spread over a large area.

♦

Composite Knife Stock Has Improved Weld

■ A vexsome problem in producing composite or "laid" knife stock has always been the so-called vertical weld, represented by the plane ABEF in the accompanying sketch. Although the weld along the plane BCDE has previously been made satisfactorily strong, the finished knife often had an unsightly appearance because of irregularities along the line AF, and in some cases the vertical weld was not sufficiently strong. Customarily there is a bevel of about 15 degrees along the vertical weld.

The Jessop Steel Company has used and is using the assembly



Composite knife stock

method in conjunction with the Armstrong method of electro-pickling and electrodeposition of iron onto the insert prior to assembly. Sufficient tonnage of the various types of composite steels has been made to prove the excellence of this system. Certain variations in the technique, for which improvements patents are being sought, have been devised to ensure a proper vertical weld in this particular type of composite steel. Although it is intended primarily for knife stock, the R-type composite steel may be used for stone cutters, lathe tools, and dies. High speed tool steel is the most notable alloy employed as the insert, but high-carbon high-chromium steel or any other type may be used.

A.S.M.E. Holding Its Fall Meeting in Providence

■ Fall meeting of the American Society of Mechanical Engineers will be held at the Providence-Biltmore hotel, Providence, R. I., Oct. 5-7. Featuring the program are three sessions on machine shop practice, one on iron and steel, one on management, two on fuels, two on power, and two on rubber.

Papers and sessions of interest to the metalworking industry are scheduled as follows:

Wednesday, Oct. 5

MORNING

Fuels

"High Pressure Installation at L Street Station, South Boston," by G. A. Orrok Jr.

"Discharge Temperatures from Pulverizers," by Ollison Craig.

Machine Shop Practice

"Recent Developments in Thread Grinding Practice," by P. V. Miller.

"The Refinement of Ground Surfaces," by H. S. Indge.

Rubber

"History of Rubber as an Engineering Material," by W. C. Geere.

"Synthetic Substances with Rubber-Like Properties," by E. R. Bridgwater.

NOON

Luncheon meeting. Speaker: Dr. Henry M. Wriston, president, Brown university.

Machine Shop Practice

"Accuracy of Borizing," by C. T. Guething.

"Gear Loading," by W. P. Schmitter.

Rubber

"Problems in the Fabrication of Rubber Products," by E. G. Kimmich.

"Mechanical Characteristics of Rubber," by F. L. Haushalter.

EVENING

Fuels

"Industrial Power Plant Steam and Power Generation," by R. D. Booth.

"Atomization of Oil by Small Pressure Atomizing Nozzles," by E. B. Glendenning, L. H. Ventres, W. A. Sullivan, and A. R. Black.

Industrial Instruments and Apparatus

"Application of an Asymptotic Reset Controller to Sewage Clarification," by R. P. Lowe.

Thursday, Oct. 6

MORNING

Machine Shop Practice

"How Useful Is Your Sense of Proportion?" by W. E. Johnson.

"Motor Drives and Electric Controls on Machine Tools," by B. P. Graves.

Power

"Condenser-Tube Life vs. Design and Mechanical Features of Operation," by A. J. German.

"Condenser Performance with Reduced Cooling Surface," by J. H. Harlow and R. A. Bowman.

"Control of Slime and Algae in Industrial Cooling Waters," by H. K. Nason and J. D. Fleming.

EVENING

Clambake at Pomham club. Speaker: Louis Johnson, assistant secretary of war.

Friday, Oct. 7

MORNING

Management

"Control of Purchases in a Small Plant," by W. C. Zinck.

"Industry, Labor and the Public," by R. M. Hudson.

Iron and Steel

"Magnaflux Inspection Applied to Aircraft Engine Parts," by H. J. Noble.

"Recent Developments in Power Metallurgy," by G. J. Comstock.

Power

"Industrial-Evaporator Design, Application, and Operation," by W. K. Adkins.

"Industrial Application of Evaporators in No. 1 Power House of the Ford Motor Co.," by W. W. Dulmage.

"HERCULES"
RED-STRAND
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WIRE ROPE

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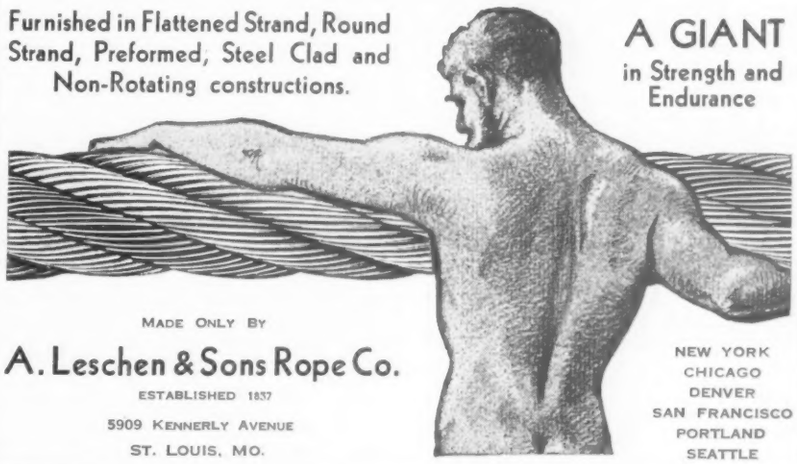

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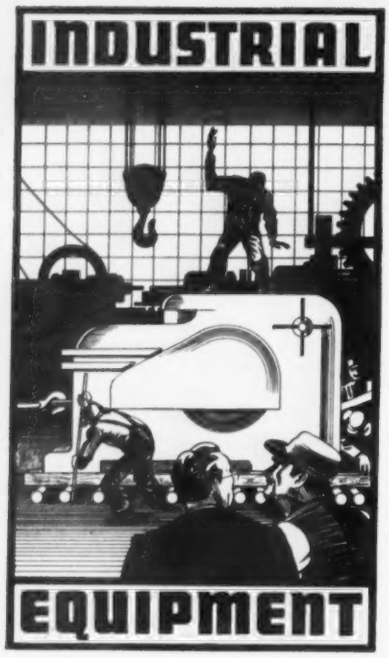


Radiant Tube Furnace Fired With Gas Fuels

■ Lee Wilson Engineering Co., 1370 Blount street, Cleveland, recently has introduced a small, cylindrical, bell type annealing furnace, heated with vertical radiant tubes, intended primarily for heat treating small tonnages per charge of coiled strip steel and coiled rod and wire.

Furnace is applied largely to conditions where there are small charges of varying time temperature cycles. Unit can be applied in shops where time in process must be reduced to a minimum, and small orders can be run through quickly.

This type of furnace is used for bright annealing and spheroidizing of hot and cold reduced material for both steel and wire, and also

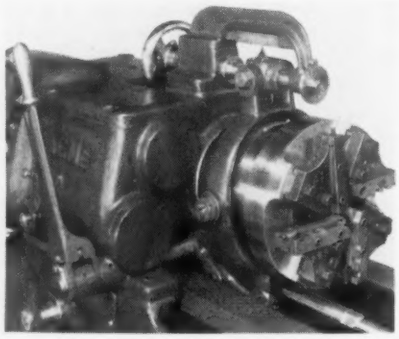
for low and high carbon steels. It is also suitable for annealing copper and brass in wire or strip form. Provision is made for a liquid seal and introduction of protecting gases over charge so that there may be no oxidizing, carburizing or decarburizing during heating cycle.

Unit is said to have inherent characteristics of an electric furnace plus advantages of throttling heat control and low cost of heating per pound of material handled. It is equipped with fan in the base for circulating gases. This improves uniformity of temperature throughout charge and speed at which charge can be cooled after heat treating. It is fired with all gas fuels from anthracite producer gas to propane.

Micrometer Permits More Accurate Die Setting

■ Acme Machinery Co., 4533 St. Clair avenue, Cleveland, has devised as the latest improvement in its line of threading machines a dial micrometer for setting tangent threading dies to within 0.001-inch accuracy on pitch diameter without stopping machine.

A double adjusting screw, another feature, permits operator to take any number of roughing cuts before



taking correct finishing cut, setting for which is not disturbed.

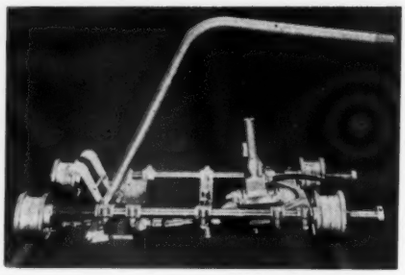
Machines are equipped with tangent die heads, consisting chiefly of two parts, die ring and barrel. Die holders are drop forged, rigidly bolted and doweled to hardened steel die slides. Eight spindle speeds are obtained through selective type gear box.

Machine illustrated, model 35, is built in single, double, triple and quadruple units, taking work up to 2-inch diameter.

Drills Holes to Take Wedge Type Rail Bond

■ Ohio Brass Co., Mansfield, O., has developed a poratble, power-driven rail drill, adjustable for all weights of rail.

Device was designed primarily to drill holes to accommodate terminals of the wedge type rail bond. Machine rides along rails on four



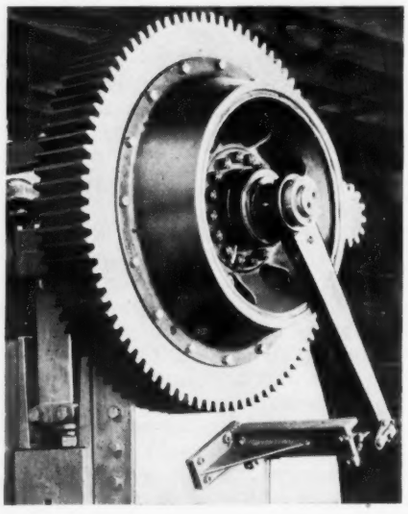
wheels, and may be operated conveniently in low ceiling mines. It is equipped to handle both ⅝ and ¾-inch drills and is powered by a standard 1-inch drill motor. Device is regularly available for line voltages of 250 and 600 volts, direct current.

Punch Press Clutch Involves New Principle

■ Industrial Clutch Co., Waukesha, Wis., has introduced recently a Servo-action punch press clutch, which is said to combine shockless, instantaneous engagement and durability of the friction clutch with positive action and simple operation of the conventional jaw or pin clutch.

A press equipped with this clutch is operated in exactly the same way as a press using jaw or pin clutch. Servo-mechanism is unique in that it consists of coacting helical splines, inner of which is keyed to crankshaft, while outer forms part of cone or driven element of the clutch. Purpose of this mechanism is to utilize high torque loads of press to boost engaging pressure between clutch surfaces to a value sufficiently high to transmit, without slipping, any torque press is capable of handling.

Mechanism comes into operation after initial engagement of clutch surfaces under spring pressure, which is just sufficient to overcome



ADVERTISING PAGES REMOVED

inertia of crank and ram and friction of band brake.

This clutch is not recommended for replacing jaw or pin type clutches on presses now in use. Its advantages can be realized only when incorporated in an original design.

Motors Operate Well in Dust-Laden Atmospheres

■ Sterling Electric Motors Inc., 5401 Telegraph road, Los Angeles, has introduced a line of fully enclosed motors which operate efficiently in atmospheres laden with dust, grit and corrosive fumes.

One-piece protected frame with ventilation from below makes it impossible for falling particles of dirt or liquids to damage active parts of motor. Foreign matter stirred up by the pulley is blown away and is not drawn into motor.

An exclusive feature is the one-piece cast aluminum herringbone rotor which improves electrical characteristics of these motors by reducing circulating currents, exciting current, heating, eddy currents, iron losses by increasing pull-out torque, starting torque and power factor. It provides smooth operation, eliminates end thrusts and lateral pounding.

Mica and asbestos are built into motor windings, making them incombustible, non-carbonizing and moisture-resisting.

Indicator Can Be Used in Many Positions

■ Lufkin Rule Co., Saginaw, Mich., has added to its line of precision tools a universal indicator, desig-

nated as No. 199, which can be read and used in practically any position.

Indicator has a rotating head, positive lock and two reading faces. One of these faces is on the front or flat side of the tool, and the other is on the end or top, making indicator suitable for jig boring, milling machine and drill press work. Tool makes a complete revolution on its own center and also on the clamping bolt. This forms what is practically a universal joint, locked in position by a single thumb nut.

A standard bar for general use and a special attachment for use in drill chuck or surface gage are furnished with each indicator. Clamping device frictionally holds indicator in position during setup. Housing is rustproof metal, and contact point and working points are hardened.

Maintains Body Salt

■ A quick, sanitary means of protecting industrial workers from heat sickness, resulting from loss of body

salt through perspiration, has been introduced by Industrial Products Co., 800 West Somerset street, Philadelphia, in the form of a salt tablet dispenser.

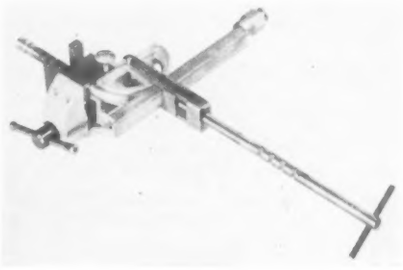
Tablets are discharged one at a time from the molded plastic container, which has a visible reserve that will hold 1500 tablets. Dispenser is fitted with a bracket for mounting at drinking fountains.

It is said a total of four to six tablets during a work period is usually sufficient to maintain proper salt balance in the body.

Shapes Metal Tubing

■ SAC Tool Mfg. Co., 1907 Washington avenue, St. Louis, has placed on the market a shaping tool which bends, cuts, flares and swedges copper, brass or aluminum soft-temper tubing.

Tool can be used to make coils, fittings and reducers or increasers. Duplicate shaped bends can be made by using straight slides which are marked to show length of tube re-

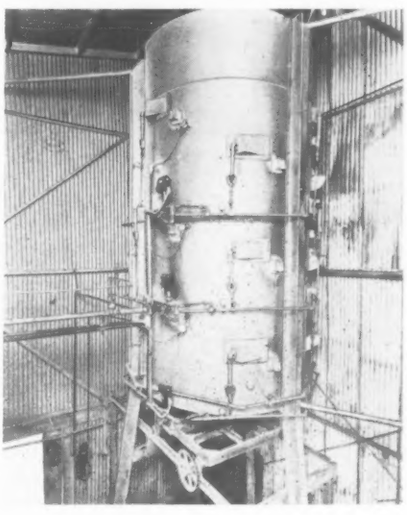


quired to make bend. Circular blocks are adjustable to allow bend to be made back of flare nut. When swedge is required at end of bend, swedge is held in vise jaws by placing straight tip in swedge and starting bend at desired point. One tip is used for all sized flares, but a separate tip is required for each size swedge.

Distortion Prevented by Vertical Muffle Furnace

■ Stewart Furnace division, Chicago Flexible Shaft Co., Roosevelt road and Central avenue, Chicago, recently completed a unique installment of a Stewart high-pressure gas-fired vertical muffle heat-treating furnace, especially designed for heat treating welded alloy tubing.

Parts to be heat treated are hung free in furnace to prevent distortion and then are allowed to drop through door in bottom of furnace into a quenching tank below, which is not shown in illustration. Furnace is equipped with a full carbofrax muffle and a 3-zone heat control to assure even distribution of heat. By means of a patented device atmosphere in furnace is controlled to prevent scaling.



Progress in Foundry Metallurgy Revealed

(*Concluded from Page* 43)

ness and strength in the as-cast condition. Type and distribution of graphite also is an important factor in determining properties of an iron.

"Effect of Undercooling on the Nature of the Graphite Pattern in Gray Cast Irons" was the title of a paper by Prof. R. Schneidewind and C. D. D'Amico, University of Michigan.

The rate of cooling, it was found, is responsible for a difference in graphite particles. Considerable undercooling, or the phenomena of the metal remaining liquid below the thermal freezing point, occurs in gray iron. A wedge having inserted thermocouples was designed to determine influence of rate of cooling. Undercooling in cast iron, it was found, may be as great as 100 degrees Fahr. below the equilibrium freezing point and still gray iron is produced. A solidification temperature between 2060 degrees and 1970 degrees Fahr. produces graphite patterns characteristic of the actual freezing temperature. The lower the temperature the finer is the graphite and the greater the tendency toward the eutectification pattern. Still greater degree of undercooling inhibits precipitation of graphite to form mottled and white irons.

Highly alloyed steel castings for heat and scale resistance were covered in a paper by James Corfield, Michigan Steel Castings Co., Detroit. He discussed their properties in three groups comprising iron-chromium, chromium-nickel and high nickel-chromium.

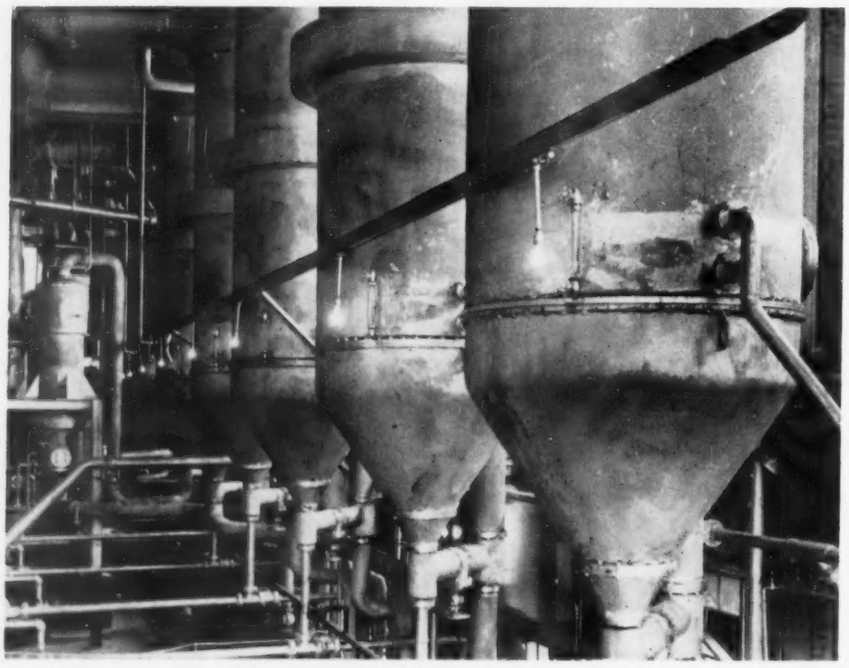
The spectrograph as a foundry tool was discussed by A. M. Sampson, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., who described an installation at this company's plant. Accurate determinations of various elements except phosphorus, carbon and sulphur can be obtained spectrographically in a short time.

Finished cast steel now used in the Ford car, according to R. H. McCarroll, Ford Motor Co., Detroit, aggregates 149 pounds per car. Included are valves, crankshafts, valve seats, wheel hubs and pistons. Two alloy cast iron parts, push-rods and camshafts, recently have replaced steel forgings. Mr. McCarroll gave average compositions and physical properties of the various castings. He also described his company's method of making steel castings centrifugally, and the advantages from this process.

"Some Factors Affecting Properties of Superheated Cast Iron" was the title of a paper presented by Dr. C. H. Lorig, Battelle Memorial institute, Columbus, O. While temperature has an important effect on properties of cast iron it unfortunately is unpredictable, he said. Ladle additions of silicon up to 0.08 to 1 per cent and pouring temperatures from 2550 to 2850, he reported, give best results. L. H. Rudesill, Griffin Wheel Co., Chicago, said effect of 97 per cent silicon as a ladle addition was the same as with 50 per cent ferrosilicon and that best results were obtained with 0.9 per cent silicon addition. Ferrosilicon, he warned, should be free from aluminum. Silicon additions have no effect with malleable composition.

"Influence of Composition on the Properties of Electric Furnace Iron" was the title of a paper by R. G. McElwee, Vanadium Corp. of America, Detroit. He said the average foundryman has little to fear from dendritic graphite formations and primary ferrite since such peculiarities occur only in irons intermediate between white cast and pearlitic irons. While control of the product is possible in the foundry in a variety of ways, it is difficult in many instances to be sure the final results will be exactly as desired. However, an extended investigation showed additions of small amounts of vanadium up to 0.3 per cent tend to stabilize the structure and make it possible to predict results. Since vanadium functions as a deoxidizer as well as a carbide stabilizer it is necessary the iron be deoxidized before addition of vanadium.

Contains 25.7 Miles of Steel Tubing



■ **Recently installed by Swenson Evaporator division of Whiting Corp., Harvey, Ill., this evaporator is one of the largest machines of its kind. It has welded steel construction throughout, and parts exposed to corrosive materials are nickel steel. Machine contains 135,845 feet of steel tubing**

Mild Steel Electrodes Have Low Spatter Loss

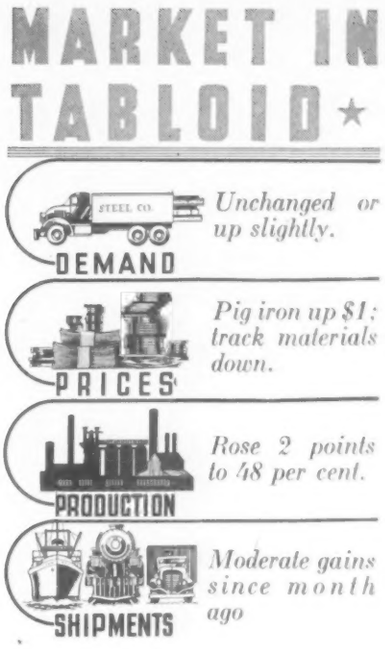
■ Three new electrodes, each protected by a heavy extruded coating, have been announced by General Electric Co., Schenectady, N. Y., for shielded arc welding of mild steel.

Especially designed for general purpose, single or multiple-pass welding, type W-20E is particularly suitable for jobs where fitup is likely to be poor. Type W-22E is a fast-melting, smooth-flowing electrode with which dense deposits can be made without slag inclusions or gas pockets. Intended primarily for welding in the flat position, type W-23E is a high-current, or "hot" rod. Its weld metal is quite fluid and washes up well on side walls of deep-groove joints and fillets.

With all three electrodes, spatter loss is low, it is claimed, and ductility of deposit is good. Resistance to corrosion is comparable to that of mild steel. Type W-22E is recommended for operation with direct current, but the other two electrodes may be used with either direct or alternating current.

Steelmaking Gains; Sales Rise Slower

Auto Requirements Expected to Aid Future Demand



■ VARIOUS factors point to further moderate gains in steel demand and production before the fall peak is passed, despite a leveling off of activity in some markets and implications that operations will follow a like course shortly.

Chief support to the October outlook is the prospect of a material expansion in automotive steel requirements compared with current low levels. Motor car assemblies again are headed upward slowly and, barring the interruption of additional labor disturbances, will account for an increasingly large share of steel output in the approaching quarter.

Markets for building steel are more active, following a brief lull earlier in the month. Federal, state and municipal projects figure prominently in pending and prospective business in structural shapes, plates and reinforcing bars, and this steel outlet gives indications of further expansion in coming weeks.

Passing, at least temporarily, of the European war scare is more beneficial to sentiment than to steel export trade of the United States, since shipments abroad had declined long before the European situation became critical. Exports, excluding scrap, were 134,110 tons in August, compared with 137,276 tons in July and 408,081 tons a year ago. Scrap shipments of 108,029 tons were off from the 126,423 tons moved in July and 478,296 tons shipped in August, 1937.

Hesitation in domestic buying of finished steel has yet to be reflected in steelmaking, the national rate climbing 2 more points to 48 per cent last week, highest since the last week of October, 1937. Gains were confined to relatively few districts, however, and slower recovery is indicated for the immediate future. Pittsburgh and Chicago districts each gained 2 points last week to 38 and 43.5 per cent, respectively. Detroit rose 10 points to 77 per cent, St. Louis was up 6.5 points to 48.5 per cent and Youngstown advanced 2 points to 48 per cent.

Operations at Wheeling dropped 2 points to 54 per cent, while districts to report unchanged rates were Buffalo at 49 per cent, Birmingham at 57 per cent, eastern Pennsylvania at 33 per cent, Cincinnati at 65, Cleveland at 48.5 and New England at 60.

Automobile output last week totaled 20,390 units, against 16,100 the week before. General Motors' production was 5895 units, compared with 4675; Chrysler assemblies rose from 5950 to 7170; Ford expanded from 515 to 1600; and other makers 5725, against 4960.

Recent announcements of fourth quarter prices on pig iron and steel serve to clear up what uncertainty had prevailed among consumers regarding future costs of materials. Anticipated reduction in tin plate did not materialize. This product was not among those reduced sharply three months ago, but the principal reason for extending the price at this time is understood to be the uncertainty over future tin quotations, due to unsettled conditions abroad.

Reduction of $2 to $5 a ton in prices of track materials was more or less expected as was also the reaffirmation of other products. At $40, the new price of standard rails, this important railroad commodity now is selling about half-way between its depression low and the pre-1932 level.

Rails and track accessories were exempted from the sweeping price cuts made late in June, hence the reductions are regarded more in the way of a logical adjustment than as a bid for railroad business. However, lower prices are counted on to provide additional stimulus to the recent slight upturn in steel purchases by the carriers, principally for equipment building and repairs.

In contrast to unchanged or lower prices on steel products, pig iron has been advanced $1 a ton, effective Sept. 27. Three months ago the market was reduced $4. While gains in pig iron consumption lately have been small, the higher market has induced forward coverage and bookings the past week spurted moderately.

Scrap shows an opposite trend. Demand is quiet in most districts, with prices slightly easier. A reduction of 50 cents a ton on heavy melting steel at Chicago lowers the scrap composite 12 cents to $14.13.

The iron and steel composite, which includes scrap, declined 6 cents to $36.44, while the finished steel composite was unchanged at $57.20.

COMPOSITE MARKET AVERAGES

	Sept. 24	Sept. 17	Sept. 10	One Month Ago Aug., 1938	Three Months Ago June, 1938	One Year Ago Sept., 1937	Five Years Ago Sept., 1933
Iron and Steel	$36.44	$36.50	$36.50	$36.50	$38.41	$40.16	$30.36
Finished Steel	57.20	57.20	57.20	57.20	61.55	61.70	48.52
Steelworks Scrap..	14.13	14.25	14.25	14.44	10.89	18.99	10.83

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 24, 1938	Aug. 1938	June 1938	Sept. 1937
Steel bars, Pittsburgh	2.25c	2.25c	2.45c	2.45c
Steel bars, Chicago	2.25	2.25	2.40	2.50
Steel bars, Philadelphia	2.57	2.57	2.47	2.74
Iron bars, Terre Haute, Ind.	2.15	2.15	2.35	2.35
Shapes, Pittsburgh	2.10	2.10	2.25	2.25
Shapes, Philadelphia	2.215	2.215	2.405	2.455
Shapes, Chicago	2.10	2.10	2.25	2.30
Plates, Pittsburgh	2.10	2.10	2.25	2.25
Plates, Philadelphia	2.15	2.15	2.38	2.435
Plates Chicago	2.10	2.10	2.25	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.40	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.45	3.55
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.75	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.40	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.65
Sheets, No. 24, galv., Gary	3.50	3.50	3.80	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	$34.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	34.00	37.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	37.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	47.00	47.00

Pig Iron

	Sept. 24, 1938	Aug. 1938	June 1938	Sept. 1937
Bessemer, del. Pittsburgh	$21.34	$21.34	$25.34	$25.26
Basic, Valley	19.50	19.50	23.50	23.50
Basic, eastern, del. Philadelphia.	21.34	21.34	21.34	25.26
No. 2 foundry, Pittsburgh	21.21	21.21	25.21	25.21
No. 2 foundry, Chicago	20.00	20.00	24.00	24.00
Southern No. 2, Birmingham	16.38	16.38	20.38	20.38
Southern No. 2, del. Cincinnati	19.89	19.89	23.89	23.69
No. 2X, Del. Phila. (differ. av.)	22.215	22.215	22.215	26.135
Malleable, Valley	20.00	20.00	24.00	24.00
Malleable, Chicago	20.00	20.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	30.34	30.04
Gray forge, del. Pittsburgh	20.17	20.17	24.17	24.17
Ferromanganese, del. Pittsburgh	97.77	97.77	107.77	107.29

Scrap

Heavy melting steel, Pittsburgh.	$15.25	$15.20	$11.40	$20.40
Heavy melt. steel, No. 2, E. Pa.	12.75	13.00	9.875	16.69
Heavy melting steel, Chicago	13.25	14.00	10.25	17.85
Rails for rolling, Chicago	17.75	18.25	14.90	20.35
Railroad steel specialties, Chicago	16.25	16.75	13.50	20.50

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.90	$4.45
Connellsville, foundry, ovens	5.00	5.00	5.05	5.25
Chicago, by-product fdry., del.	10.50	10.50	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown	2.15c
Youngstown	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown	3.20c
Youngstown	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown	3.50c
Youngstown	3.50c
Pacific Coast points	4.00c

Tin Mill Black Plate

Pittsburgh	3.15c
Chicago, Gary	3.15c
Granite City, Ill.	3.25c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin plate, coke (base box) Pitts., Gary, Chgo.	$5.35
Granite City	5.45
Mfg. terne plate, Pittsburgh, Gary, Chgo.	4.65c
Granite City	4.75c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c

Iron

Terre Haute, Ind.	2.15c
Chicago	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports, f.o.b. car docks	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45

(Per pound)

Polished staples	3.15c
Galv. fence staples	3.40c
Barbed wire, galv.	3.20c
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts.-Cleve.-Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

*Delivered.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.80c

Detroit, delivered 2.90c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55

4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10

5100 0.80-1.10 Cr. 0.45

5100 Cr. spring flats 0.15

6100 bars 1.20

6100 spring flats 0.85

Cr. N., Van. 1.50

Carbon Van. 0.85

9200 spring flats 0.15

9200 spring rounds, squares 0.40

Electric furnace up 50 cents.

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23⅛-in.

Pittsburgh, Chicago, Gary, Cleveland Youngstown, Middletown Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Pittsburgh, Chicago	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass., $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chgo., B'ham.	3.15c
Tie plates, base	$43.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-12½ off; bulk 85 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off
Plow bolts	65-5-5 off

Nuts

Semifinished hex. U.S.S.	S.A.E.
¼-⅞-in., incl.	65-10 70-5
½-⅞-in., incl.	65-5 70
⅝-1-in., incl.	60-10 65
1⅛ and larger	60-5 60-5

Hexagon Cap Screws

Milled	50-10-5 off
Upset, 1-in. smaller	67½-10 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	70-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland	3.40c
Structural, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B

Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 9/32-inch incl.	43.00
Do., over 9/32 to 47/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens.	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens.	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$27.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$21.00	$21.50	$20.50	$22.00
Birdsboro, Pa.	21.00	21.50	20.50	22.00
Birmingham, Ala.‡	16.38	.....	15.38	21.00
Buffalo	20.00	20.50	19.00	21.00
Chicago	20.00	20.00	19.50	20.50
Cleveland	20.00	20.00	19.50	20.50
Detroit	20.00	20.00	19.50	20.50
Duluth	20.50	20.50	.....	21.00
Erie, Pa.	20.00	20.50	19.50	21.00
Everett, Mass.	21.75	22.25	21.25	22.75
Granite City, Ill.	20.00	20.00	19.50	20.50
Hamilton, O.	20.00	20.00	19.50	.....
Neville Island, Pa.	20.00	20.00	19.50	20.50
Provo, Utah	18.00	.....	.....	.....
Sharpsville, Pa.	20.00	20.00	19.50	20.50
Sparrow's Point, Md.	21.00	.....	20.50	.....
Swedeland, Pa.	21.00	21.50	20.50	22.00
Toledo, O.	20.00	20.00	19.50	20.50
Youngstown, O.	20.00	20.00	19.50	20.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	21.39	21.39	20.89	21.89
Baltimore from Birmingham	21.78	.....	20.66	.....
Boston from Birmingham	21.87	.....	.....	.....
Boston from Everett, Mass.	22.25	22.75	21.75	23.25
Boston from Buffalo	22.25	22.75	21.75	23.25
Brooklyn, N. Y., from Bethlehem	23.50	24.00	.....	.....
Canton, O., from Cleveland	21.39	21.39	20.89	21.89
Chicago from Birmingham	†20.22	.....	.....	.....
Cincinnati from Hamilton, O.	20.44	21.11	20.61	.....
Cincinnati from Birmingham	20.06	.....	19.06	.....
Cleveland from Birmingham	20.32	.....	19.82	.....
Mansfield, O., from Toledo, O.	21.94	21.94	21.44	21.44
Milwaukee from Chicago	21.10	21.10	20.60	21.60
Muskegon, Mich., from Chicago, Toledo or Detroit	23.19	23.19	22.69	23.69
Newark, N. J., from Birmingham	22.15	.....	.....	.....
Newark, N. J., from Bethlehem	22.53	23.03	.....	.....
Philadelphia from Birmingham	21.46	.....	20.96	.....
Philadelphia from Swedeland, Pa.	21.84	22.34	21.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	22.45	22.45	21.95	21.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	20.50	20.50	20.00	.....
St. Louis from Birmingham	†20.12	...	19.72	.....
St. Paul from Duluth	22.63	22.63	.....	23.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $25.50, Phil. base, standard and copper bearing, $26.63.

Gray Forge		Charcoal	
Valley furnace	$19.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	19.50	do., del. Chicago	28.34
		Lyles, Tenn	23.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $24.50; 6.51-7—$25.00; 7-7.50—$25.50; 7.51-8—$26.00; 8-8.50—$26.50; 8.51-9—$27.00; 9-9.50—$27.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39 90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $92.50
Do., del. Pittsburgh 97.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., New Orleans 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 97.75
2% carbon 102.75 1%, 112.75
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, freight allowed lb. 4.75c
Ton lots 5.25c
Less-ton lots 5.50c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.76
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.40
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.50
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.68
Detroit	3.68	3.83	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.01	4.16	4.16	3.96	3.96	5.71	3.91	....	5.26
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	....	5.15
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	4.20	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	4.20	....	5.50
Portland, Oreg.	4.30	4.70	6.10	4.15	4.15	5.90	3.75	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	3.85	3.95	5.45	4.00	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.36	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	.	.	.	.	....	..
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.95	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	4.10	3.83	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.64	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	4.18	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.90	.	.	..	....	....	....	....
Tulsa, Okla.	....	5.09	....	..	.	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	..	....	.	.	..	..	...
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70		
Los Angeles	4.45	6.60	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

*Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Sept. 22

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons: **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$26.45 5 10 0	$15.32	1 17 0
Basic bessemer	.....	18.42	2 4 6
Hematite, Phos. .03-.05	31.26 6 10 0*	.....	.....
Billets	$37.88 7 17 6	$35.19	4 5 0
Wire rods, No. 5 gage	54.23 11 5 6	42.44	5 2 6
Standard rails	$48.70 10 2 6	$47.61	5 15 0
Merchant bars	2.37c 11 0 0	1.92c to 1.97c	5 2 6 to 5 5 0
Structural shapes	2.28c 10 12 6	1.83c	4 17 6
Plates, †¼ in. or 5 mm.	2.49c 11 11 3	2.11c to 2.30c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.80c 13 0 0	2.72c	7 5 0°
Sheets, gal., 24 ga., corr.	3.60c 16 15 0	3.28c	8 15 0
Bands and strips	2.85c 13 5 0	2.16c	5 15 0
Plain wire, base	4.19c 19 10 0	2.30c to 2.72c	6 2 6 to 7 5 0
Galvanized wire, base	5.00c 23 5 0	2.94c to 3.04c	7 17 6 to 8 2 6
Wire nails, base	3.98c 18 10 0	2.62c to 2.81c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$4.87 1 0 3	.....	.....

British ferromanganese $92.50 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$26.21 5 9 0(a)	$16.15	598	$14.83	440	$25.20 63
Basic bess. pig iron	24.05 5 0 0(a)	....	....	.....	....	27.80 (b) 69.50
Furnace coke	6.61 1 7 6	5.54	205	7.25	215	7.60 19
Billets	37.88 7 17 6	22.68	840	28.98	860	38.60 96.50
Standard rails	2.18c 10 2 6	1.38c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.62c 12 4 0††	1.30c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.37c 11 0 6††	1.27c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.52c 11 14 3††	1.62c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.39c 15 15 0§	1.92c	1,600‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.98c 18 10 0	2.70c	2,250	4.13c	2,750	6.66c 370
Plain wire	4.19c 19 10 0	1.99c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.78c 12 19 0††	1.45c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 70 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	†11.00
Bos. dock No. 1 exp.	12.00-13.00
New Eng. del. No. 1	13.00
Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	13.00-13.50
Chicago, auto, no alloy	11.50-12.00
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	12.50-13.00
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.75-10.25
Eastern Pa., No. 1	14.00-14.50
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	12.00-12.50
Granite City, R. R.	12.50-13.00
Granite City, No. 2	12.00-12.50
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
N.Y. dock No. 1 exp.	11.50-12.00
Pitts., No. 1 (R. R.)	16.00-16.50
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	14.00-14.50
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.50-12.00
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dirs. No. 1	9.00- 9.50
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	12.25-12.75
Chicago, dealer	10.75-11.25
Cincinnati,, del.	10.25-10.75
Cleveland	12.00-12.50
Detroit	12.00-12.50
E. Pa., new mat.	14.00-14.50
E. Pa., old mat.	10.00-10.50
Los Angeles	12.50-13.00
Pittsburgh	15.00-15.50
St. Louis	10.00-10.50
Valleys	13.00-13.50

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	10.00-10.50
Los Angeles	11.00-11.50
Pittsburgh	14.00-14.50
St. Louis	7.50- 8.00
Toronto, dealers	4.00

SHEET CLIPPINGS, LOOSE

Chicago	9.00- 9.50
Cincinnati, dealers	6.25- 6.75
Detroit	8.50- 9.00
†Los Angeles	3.75- 4.00
St. Louis	7.00- 7.50

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	11.50-12.00
Cincin., No. 1, deal.	6.50- 7.00
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	10.50-11.00
Valleys, new, No. 1	13.00-13.50
Toronto, dealers	4.00

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.75- 4.25
Cleveland	7.00- 7.50
Detroit	5.00- 5.50
Eastern Pa.	8.00- 8.50
Los Angeles	4.00- 4.25
New York	†3.50- 4.00
Pittsburgh	9.50-10.00
St. Louis	5.00- 5.50
Toronto, dealers	4.25- 4.75
Valleys	8.50- 9.00

SHOVELING TURNINGS

Buffalo	8.00- 8.50
Cleveland	7.50- 8.00
Chicago	7.00- 7.50
Detroit	6.50- 7.00
Pittsburgh	10.50-11.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.50
Cincinnati, dealers	3.25- 3.75
Cleveland	7.50- 8.00
Eastern Pa.	6.00- 6.50
Detroit	5.00- 5.50
New York	†2.50- 3.00
Pittsburgh	8.50- 9.00
Toronto, dealers	3.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.50-14.00
Eastern Pa.	10.50-11.00
St. Louis	9.00- 9.50
Toronto	5.00

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†5.00- 5.25
Buffalo	7.00- 7.50
Chicago	5.50- 6.00
Cincinnati, dealers	3.25- 3.75
Cleveland	7.25- 7.75
Detroit	5.00- 5.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	4.25-4.75
Toronto, dealers	3.50

RAILROAD SPECIALTIES

Chicago	16.25

ANGLE BARS—STEEL

Chicago	15.00-15.50
St. Louis	14.50-15.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	16.00-16.50
Eastern Pa.	16.50-17.00
Pittsburgh	17.00-17.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	16.75-17.25
Detroit	16.50-17.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	17.00-17.50
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	14.00-14.50
Cleveland	17.00-17.50
Pittsburgh	16.00-16.50
St. Louis	13.75-14.25
Seattle	16.00

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	13.50-14.00

ARCH BARS, TRANSOMS

St. Louis	15.00-15.50

PIPE AND FLUES

Cincinnati, dealers	6.00- 6.50
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	8.00- 8.50
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.00-13.50
New York	†8.50- 9.00
St. Louis	8.50- 9.00

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Chicago, No. 1 net	9.50-10.00
Eastern Pa., No. 1	15.00-15.50
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	12.50-13.00
Toronto, No. 1 dlr.	10.00

FORGE FLASHINGS

Boston district	†6.75- 7.25
Buffalo	12.00-12.50
Cleveland	11.50-12.00
Detroit	8.75- 9.25
Los Angeles	9.00
Pittsburgh	13.00-13.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	16.50-17.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	16.50-17.00
Pittsburgh, crops	17.00-17.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	16.50-17.00
Eastern Pa.	17.00-17.50
Pitts. (light & hvy.)	15.50-16.00
Seattle	15.00

RAILS FOR ROLLING

3 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†15.00-15.50
Eastern Pa.	17.00-17.50
St. Louis	16.50-17.00

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00
Chicago, net	19.50-20.50
Eastern Pa.	21.50-22.50
St. Louis	18.50-19.00

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	14.00-14.50

SHAFTING

Boston district	†14.25
New York	†15.00-15.50
Eastern Pa.	19.50-20.00
St. Louis, 1¼-3¾"	17.00-17.50

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	14.00-14.50
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	16.50-17.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.00-17.50
St. Louis, iron	14.00-14.50
St. Louis, steel	15.00-15.50

NO. 1 CAST SCRAP

Birmingham	†12.50-13.00
Boston, No. 1 mach.	†10.50-11.00
N. Eng. del. No. 2	11.00-11.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	11.50-12.00
Chicago, auto net	13.00-13.50
Chicago, railr'd net	11.50-12.00
Chicago, mach. net	13.00-13.50
Cincin., mach. deal.	12.00-12.50
Cleveland, mach. net	16.75-17.25
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	13.50-14.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	12.00-12.50
St. L., No. 1, mach.	14.00-14.50
St. Louis, agr. mach.	12.75-13.25
Toronto, No. 1, mach., net	11.00-12.00

HEAVY CAST

Boston dist. break.	†10.25-10.75
New England, del.	†12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break. net	13.00-13.50
Detroit, auto net	11.50-12.00
Detroit, break.	9.50-10.00
Eastern Pa.	16.00-16.50
Los Ang., auto, net	13.00-13.50
New York, break.	†11.00-11.50
Pittsburgh, break.	13.00-13.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	9.00- 9.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdy.	†10.00-10.50
St. Louis	10.00-10.50
Toronto, dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	15.00-15.50
Cincin., agri. deal.	11.50-12.00
Cleveland, rail	15.00-15.50
Eastern Pa., R. R.	15.50-16.00
Los Angeles	17.50-18.00
Pittsburgh, rail	14.50-15.00
St. Louis, R. R.	12.50-13.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	13.00
Swedish low phos.	13.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton unit, duty pd. nom.	$21.00-22.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	nom. 35.00
so. African,, 50-52% nom.	35.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 64

Pittsburgh—Current sheet prices are being extended into fourth quarter. This is in line with expectations and has been without effect on demand. Output of common and full finished sheets remains slightly above 45 per cent, aided by releases against automotive orders and fair buying on the part of other consumers. Galvanized sheet business continues to gain, helped by jobber buying. Agricultural demand for roofing and siding is the most important factor in galvanized sales.

Cleveland—Sellers of hot and cold-rolled sheets note a slight letdown in miscellaneous demand the past week. This is regarded as only temporary and as due primarily to the foreign situation. Orders from automobile builders have subsided, following purchases for initial runs of new models, but additional buying is anticipated next month. Announcement of the extension of present prices into fourth quarter is expected to have a beneficial effect on demand.

Chicago—Inland Steel Co. has established Chicago as a new basing point for sheets, with prices the same as at Gary. The latter previously was the sole basing point for local sheet producers. The new setup has practically no effect on delivered prices. Sales here are in fair volume, following a slight letdown earlier this month. One producer reports better business, while all interests look for slow but steady improvement, chiefly from automotive sources. Current sheet prices are being extended into fourth quarter.

Boston—Sheet buying is improving less rapidly, practically all finishes being affected. September business to date is slightly ahead of August, due largely to a spurt in blue annealed demand from small tank fabricators earlier in the month. Extension of present prices into fourth quarter has not influenced buying materially, little forward covering for that period having been done. Jobbers are ordering small lots more frequently.

New York—A small spurt in sheet sales is looked for, following the opening of fourth quarter books at unchanged prices, since some tonnage had been pending in anticipation of price announcements. Improvement in demand lately has been retarded by slowness with which automotive accessory releases and building requirements have developed. On the other hand, manufacturers of electrical household appliances are more active, stocks of refrigerators are expected to be materially reduced by late fall and stove specifications continue brisk. Stainless steel sheets are in relatively good demand.

Philadelphia—On 1000 tons of 25 gage cold-rolled sheets, 12 x 84 inches for 1940 Pennsylvania automobile license plates, Morris Wheeler & Co., Philadelphia, is low at 3.725c, delivered Western State penitentiary, Pittsburgh. Eight other bidders quoted 3.76c. Sellers are figuring on 650 tons of cold-rolled, high-carbon sheets, principally 22 gage, for anti-aircraft guns for the army. A leading autobody maker here is increasing releases of cold-rolled and hot-rolled pickled sheets. Demand from heating equipment and radio manufacturers is improving seasonally.

Cincinnati — Opening of fourth quarter books by district sheet mills at unchanged prices so far has been without effect on forward buying. Business lately has consisted chiefly of small lots for rush shipment. Automotive specifications are heavier but below expectations. Rolling schedules are near 50 per cent, compared with a 65 per cent steelmaking rate. Steadiness in miscellaneous demand, especially for galvanized sheets, continues a major factor in the strong market undertone.

St. Louis—Seasonal requirements account for a moderate acceleration in demand for hot and cold-rolled sheets. Specifications from warehouses have broadened, and railroads are buying more freely for repair work. New business is almost exclusively for immediate needs, there being no disposition to build up stocks. Mills are taking numerous small orders which ordinarily would go to warehouses. Galvanized and enameling sheets are the most active items.

Birmingham, Ala.—Sheet production has shown a steady increase and is leading in current business. So marked has the demand become, especially during the past two weeks, that some backlog has accumulated, especially in roofing sheets.

Strip

Strip Prices, Page 65

Pittsburgh—Strip demand, dependent largely on automotive business, is slow to improve. Production of both hot and cold strip continues slightly over 30 per cent, equal to the last week of August. Cold-rolled material is a trifle more active than hot strip, but until automotive releases against current orders are stepped up, little improvement in production is in prospect.

Chicago—Strip demand from both miscellaneous and automotive accessory sources is expected to be enlarged considerably in coming weeks. Sales lately have been well maintained, with business improved slightly in some directions.

Buffalo — While strip production is holding fairly well at about 50 per cent, business is having difficulty maintaining the volume of the two preceding weeks. Principal demand is from small miscellaneous users, as business from the automotive industry is slow to appear. Several accessory plants have increased operations in this district, but orders from the industry as a whole are below expectations.

St. Louis—Miscellaneous demand continues to support the improvement in strip business which has prevailed the past 30 days. Stamping companies account for fairly large tonnages, while metal furniture manufacturers have increased their purchases. Outlet through the cooperage industry retains the dull status of recent months. Bale ties are moving actively to the cotton areas.

Birmingham, Ala.—While not as active as it has been the past few weeks, due to the advanced cotton ginning season, cotton ties continue to move at a satisfactory rate.

Plates

Plate Prices, Page 64

Philadelphia—About 12,000 tons of hull steel will be required for three C-2 boats on which the maritime commission will open bids Nov. 1. The boats will be operated by the Mississippi Shipping Co. for service between New Orleans and South America and are in addition to the maximum of 12 boats on which the commission will open bids Oct. 18. The navy has postponed bids on battleships, requiring 16,000 tons, from Oct. 5 to Oct. 19. Meanwhile specifications are light, with some sellers doubtful if September bookings will better those of August.

Cleveland — Plate business has changed little this month. Inquiries are more numerous but they are slow to close. A substantial plate tonnage will be required in fabricating 3000 feet of 42-inch steel pipe for a water intake at Sandusky, O., on which bids close Sept. 28. Sellers anticipate a moderate improvement in bookings this month compared with August. Prices are firm.

Boston — Prospective plate business looms large in New England,

principally for large diameter steel pipe. Specifications for at least 10,000 tons for installation in the Boston and Hartford, Conn., districts will be out within the next few weeks. Standpipes and elevated tanks under consideration also will take a substantial plate tonnage. Current buying, however, has leveled off at the recently improved rate. Little work is appearing from boiler shops and while railroad releases are up a trifle, they are far from encouraging.

New York — Plate specifications have moderated lately, but many sellers regard this as only a temporary lull. Railroad releases have yet to show any appreciable gain, further delay has occurred in placing of important ship work and miscellaneous specifications are less active. Building activity is well sustained for this season and tends to bolster plate demand. Tank work, however, is behind expectations, due to delay in issuing specifications, though a number of PWA projects are scheduled to go ahead soon.

Birmingham, Ala.—Due largely to increased activity by tank builders, and demand from miscellaneous sources which has held up exceedingly well, mills are turning out a large quantity of plates. Indications are that sustained production will continue through most of the year.

Seattle—Large projects are lacking but shops report fair business in boilers, service station contracts and miscellaneous plate work. Ship repair plants are taking a normal tonnage.

San Francisco—Interest in plates centers around bids to be opened Oct. 4 by the metropolitan water district, Los Angeles, for more than 71,000 feet of 51-inch welded steel pipe or 50-inch, plate-lined reinforced concrete pipe, involving 7000 to 8000 tons. Recent awards total only 142 tons, bringing bookings for the year to 25,272 tons, compared with 42,439 tons for the corresponding 1937 period.

Plate Contracts Placed

720 tons, 13 tanks, Shell Union Oil Co., Sewaren, N. J., to Hammond Iron Works, Warren, Pa.

475 tons, 11,000 feet, 24-inch, welded steel pipe, Philadelphia, to American Rolling Mill Co., Middletown, O.

235 tons, 1,000,000-gallon standpipe, Brookline, Mass., to Chicago Bridge & Iron Co., Chicago.

125 tons, four tanks, Barrett Co., Philadelphia, to Graver Tank & Mfg. Co., Inc., East Chicago, Ind.

Plate Contracts Pending

12,000 tons, hull steel, three C-2 boats for operation by Mississippi Shipping Co.; bids to United States maritime commission, Nov. 1.

7000 to 8000 tons, 50 or 51-inch reinforced concrete plate lined or welded steel pipe, second section Palos Verdes feeder of Colorado aqueduct distribution system, metropolitan water district, Los Angeles; bids Oct. 4.

208 tons, navy, various deliveries; bids in, Sept. 13, schedule 4318, bureau of supplies and accounts, Washington.

Bars

Bar Prices, Page 64

Pittsburgh — Merchant steel bar prices have been reaffirmed for fourth quarter, as expected. The only revision in carbon and alloy grades is an increase in extra for the recently introduced lead-bearing steel bars. Business is well sustained but has yet to reach satisfactory volume.

Cleveland—Commercial and alloy steel bar users are entering the market for increasing tonnages as seasonal factors, particularly in the automotive industry, exert stronger influence on demand. Reflecting this moderate improvement, mill operations have advanced slightly, and further gains are anticipated the remainder of the month.

Boston — Slight improvement in bar demand is centered mostly on alloys, orders for which are more numerous though small individually. Needs of forging shops are gaining, while shipyard releases are steady. Requirements of some railroads are heavier. Better orders for textile mill equipment is being reflected in more interest in cold-finished material.

Philadelphia — Commercial steel bars are moving slowly, with tonnages small but diversified. Cold drawn and hot alloy bars continue relatively more active than carbon material, due in a measure to government specifications.

Buffalo—Bar demand is holding at the recently improved level despite lagging specifications from railroads and the automotive industry. Orders from machinery builders are expanding, but business still is largely of a miscellaneous character. Inquiries from jobbers are heavier. Present prices have been reaffirmed for fourth quarter.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

While additional changes in bolt, nut, and rivet specifications are slight, recent gains are held. Demand is widely diversified, including jobbers, automotive interests and railroads. While orders from the carriers are far below normal, some producers see possibilities of a fair gain this fall, because of necessary repair work to equipment. Construction work has become an increasingly important factor in demand, and suppliers look for a further increase as public works become more active. Rivet prices are steady, and while bolt and nut quotations are reported still weak in the jobber market, a stronger tone is noted on consumer purchases. Extension of present prices into fourth quarter is indicated.

Pipe

Pipe Prices, Page 65

Pittsburgh—Pipe demand continues upward slowly. Gains in sales of pressure and mechanical tubing have been notable, with automotive orders accounting for most of the increase in the latter. Oil country goods and line pipe also have shared in the upswing. Little change is noted in standard pipe movement, but numerous public works projects now in the formative stage will require considerable tonnage. Railroads are buying little, with slight prospect of any marked upturn the balance of the year. A number of pipe lines are becoming active, though it is problematical how soon some of these will develop into actual orders.

Cleveland—Movement of standard steel pipe from jobbers' stocks shows little change. Bids have been taken on about 1200 tons of 4 to 10-inch cast pipe for a Cincinnati water system extension, while 500 tons has been placed for similar work at Mentor, O. A number of municipal water system jobs will be up for bids the next 30 days and are expected to bolster cast pipe demand.

Chicago — Business in cast iron pipe has been spotty lately, this resulting from sudden spurts in PWA inquiries. At present little of such tonnage is pending, however. Inquiries include 268 tons of fittings for a La Grange, Ill., sewage disposal plant. A large tonnage of pipe will be required for a local sewage disposal plant proposed for the south side lake front. Plans have yet to be completed.

Birmingham, Ala.—Cast iron pipe plants have not received quite the volume of business they expected before the end of this quarter. Nevertheless, there has been an upward trend in inquiries and a definite increase in specifications from government sources. Opinion is that the last quarter will bring a substantial increase in volume of spot business.

New York—A substantial tonnage of steel pipe is pending, though or-

ders recently have been light. Outstanding prospective business are requirements of three large housing projects. Cast pipe orders and inquiries are rising. More tonnage has been placed by utilities and several sizable export orders have been booked, notably for South America. Pending business includes 600 tons for Cortlandt, N. J.

About 2000 tons of small-diameter pipe for heating requirements of the Metropolitan Life Insurance Co. housing project has been placed with a Pittsburgh producer. As much as 1000 tons of plumbing pipe is yet to be bought, but if stoves are electric instead of gas fired, pipe needs may be only 500 tons or less. About 1000 tons of pipe for the heating contract on the Red Hook housing project remains to be placed.

Seattle—Federal grants and loans have been approved for numerous Pacific northwest cities, with sizable pipe business expected to develop soon. Localities for proposed municipal work include Spokane, Wenatchee, Vancouver, Woodland, Rickfield and Vader, Wash., and Georgetown, Idaho. Reclamation bureau at Denver has taken bids on 380,000 feet of 1-inch and 5000 feet of 6-inch black pipe.

San Francisco—Largest of recent cast pipe awards, totaling 439 tons, calls for 298 tons for Vallejo, Calif. Lettings for the year to date are 23,538 tons, against 22,346 tons a year ago. Pending business in steel pipe includes 682 tons of seamless for Long Beach, Calif., on which new bids were opened last week.

Cast Pipe Placed

298 tons, Vallejo, Calif., to United States Pipe & Foundry Co., Burlington, N. J.
141 tons, 3 to 6-inch, water district No. 54, Seattle, to unnamed interest.
Unstated tonnage, river crossing water main, Manitowoc, Wis., to McMullen & Pitz Construction Co., Manitowoc, at $25,000.

Cast Pipe Pending

1200 tons, 4, 6, 8 and 10-inch, extension to water system, Cincinnati; bids Sept. 20.
500 tons, water distribution system, Mentor, O.; Gallagher & O'Hara, Youngstown, O., general contractors.
268 tons, fittings, sewage disposal plant, La Grange, Ill.
100 tons, 4 to 8-inch, La Mesa, Lemon Grove and Spring Valley irrigation district, La Mesa, Calif.; Bids Oct. 3.
Unstated tonnage, 4, 8 and 10-inch water pipe, fittings, Fond du Lac, Wis.; bids closed Sept. 21.

Steel Pipe Placed

200 tons, 8-inch pipe line from San Francisco to Alcatraz Island, Calif., to unnamed interest.

Steel Pipe Pending

682 tons, seamless line pipe, specification 587, Long Beach, Calif.; new bids

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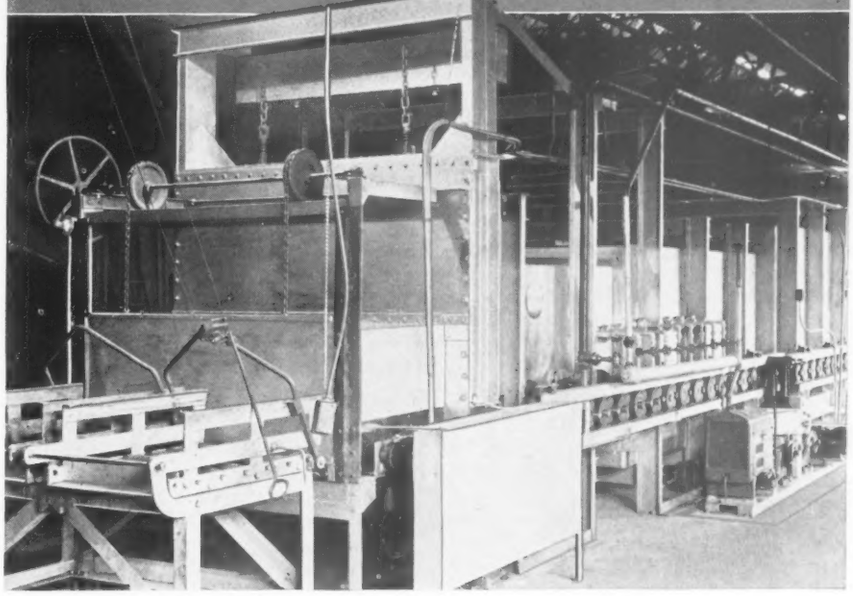

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opened on Sept. 24 and bids for same tonnage under specification C-586, rejected.

Wire

Wire Prices, Page 65

Pittsburgh—Activity in wire and wire products increased slightly the past week. Orders are holding up better than was expected, being supported by strong farm demand and some stocking by jobbers. Manufacturers' wire is contributing a larger share of total business, with rising automotive needs offsetting slackness in consumption by farm equipment builders. Wire production is 60 to 70 per cent and is fairly evenly divided between merchant and manufacturing divisions. September business will be substantially ahead of August totals.

Cleveland—Current prices on rods, wire and wire products have been reaffirmed for fourth quarter. Demand for merchant products, while seasonally quiet, is more active, but the bulk of business is confined to wire rods and manufacturers' wire going to makers of bolts and nuts, springs and various other automotive suppliers. Business in wire mesh in this area is restricted. Mill operations have remained substantially unchanged so far this month.

Chicago—Extension of wire prices into next quarter is not expected to affect buying since this move was anticipated. Demand continues to gain slowly, with the outlook favorable. Automotive buying is somewhat disappointing, due to delays in placing of larger orders. Demand elsewhere is fair to good, with metal furniture and household equipment manufacturers more active than a year ago. Rod requirements of bolt and nut makers continue small. Low level of [illegible] automotive interests point to increased buying soon.

New York — Deliveries on wire products from the New England districts, notably specialties, are seriously hampered by freight traffic delays resulting from the hurricane which hit that district badly. Local freight embargoes have been declared and mill damage in some districts is extensive. Demand is steady, but has leveled off slightly. Despite uncertainty as to deliveries and buying, September tonnage will probably be slightly ahead of last month.

Birmingham, Ala. — Current demand for wire products is somewhat less than earlier in the quarter. Booked business, while it has shown no marked decline, continues to ease off from week to week. Production, however, remains on a comparatively satisfactory basis.

Rails, Cars

Track Material Prices, Page 65

Most important railroad inquiry before the trade is that of New York Central, covering fourth quarter requirements for plates, shapes, bars and other miscellaneous steel. This tonnage should be substantial to cover the projected fall equipment program.

Chicago, Milwaukee, St. Paul & Pacific is building 500 all-welded steel flat cars of special design at its Milwaukee shops, to be completed by Nov. 30. It has just completed construction of 61 passenger coaches. Seattle light department has called for bids Oct. 3 for a 35-ton diesel locomotive.

Standard steel rails have been reduced from $42.50 to $40 per ton, effective immediately. Angle bars have been marked down $2, cut spikes $3, screw spikes $5 and tie plates $3, following the reduction of $4 on track bolts the previous week. No announcement has been made on light rails and forged car axles.

Car Orders Placed

Chicago, Milwaukee, St. Paul & Pacific, 500 welded steel flat cars to own shops.

Car Orders Pending

Nevada Consolidated Copper Corp., 15 to 20 thirty-yard dump cars.

Locomotives Pending

City of Seattle, light department, one 35-ton diesel locomotive; bids Oct. 3.

Buses Booked

American Car & Foundry Motors Co., New York: Twenty-six 35-passenger for Brooklyn Bus Corp., Brooklyn, N. Y.; eight 37-passenger for Florida Motor Lines Corp., Jacksonville, Fla.; two 25-passenger for Oahu Railway & Land Co., Honolulu, T. H.

Twin Coach Co., Kent, O.: Sixteen 35-passenger for Dallas Railway & Terminal Co., Dallas, Tex.; seven 35-passenger for Houston Electric Co., Houston, Tex.; four 31-passenger for Mississippi Power & Light Co., Jackson, Miss.

Tin Plate

Tin Plate Prices, Page 64

Chicago—Some pickup in tin plate demand is in prospect here despite failure of producers to make the anticipated reduction in prices. Although the season has affected the market adversely, the possibility of lower quotations recently had induced consumers to restrict purchases. The market continues $5.35, Gary or Chicago. The latter has been established as a new basing point for tin mill products by Inland Steel Co.

New York—Reaffirmation of tin plate prices for fourth quarter is expected to result soon in release of some tonnages held up pending price announcements. This prospective business is much heavier than in other lines which, with the exception of track material, were counted on to continue at existing prices. Uncertainty with respect to future prices of pig tin was advanced as a factor in the decision to hold tin plate prices unchanged. At the time of the announcement European hostilities appeared imminent and sellers of tin were refusing to quote on future deliveries.

Pittsburgh—Tin plate has been reaffirmed for fourth quarter at $5.35 a base box, Pittsburgh. Consumers had looked for a reduction, since tin plate was not affected by the widespread price cuts of three months ago, and in the meantime buying had been curtailed to bare necessities. Production has averaged 30 to 35 per cent for several months. It is thought unlikely any change will be made in prices before the end of the year, at which time prices on 1939 contracts are expected to depend in large part on the European outlook. Further reduction in stocks next quarter is counted on to reduce inventories to the lowest level in years.

Shapes

Structural Shape Prices, Page 64

Pittsburgh — Structural activity has improved recently. There is undoubtedly a larger amount of tonnage awaiting placement than in earlier months this year, although there is little private work included in the new projects. Extensions to the machine and structural shops of the navy at Charleston, S. C., will require 460 tons, while the reconstruction of Herr's Island bridge, Pittsburgh, will take 400 tons of plates and shapes.

Cleveland—While private building requiring structural shapes is more active, public projects still dominate the market. Outstanding private inquiry is 200 tons for a factory building here for the Weldrods Corp. Sam W. Emerson has been awarded the general contract for the west approach to the Main street bridge, Cleveland, taking 1200 tons of shapes and 1500 tons of bars. Fabricated shape prices remain weak.

Chicago—Structural steel sales are steadier, following a small slump earlier in the month. Most orders take small lots, but awards are

heavier and several large tonnages are pending. Two local bridge contracts call for 850 tons of fabricated shapes.

Boston — Structural contracts involve approximately 1250 tons, the Everett, Mass., shop booking 650 tons, addition, Malden, Mass., high school, outstanding. Small tonnage inquiry continues to come out in better volume, notably schools, Abington and Pepperell, Mass., adding to a growing list. Bridge needs are light with nothing beyond I-beam or small plate girder spans active, an exception being 600 tons, two 184-foot truss spans, Westfield, Mass., closing Oct. 3.

New York—Following the heaviest week in several years, structural steel tonnage involved in current contracts is lower with close to 1000 tons for a Hoboken, N. J., viaduct outstanding. New inquiry for small projects is gaining, but few large tonnage jobs have developed. Close to 15,100 tons for the Meeker avenue bridge superstructure is being figured for bids shortly, while the general contract has been awarded for grade crossings, 700 tons, Pennsylvania railroad, Woodbridge, N. J.

Philadelphia — Structural demand is featured by navy requirements for a yard here and in Charleston, S. C. General inquiry includes 2000 tons for a state industrial school, Whitehill, Pa., which is being revived for bids Oct. 14. Fabricated prices continue weak.

Buffalo — Structural activity has revived moderately, due principally to federal spending. General contract for the Lakeview housing project, involving 2140 tons of various steel products, went to John W. Cowper Co., Buffalo. Work on this city's new $2,700,000 convention hall is to start soon after the selection of a site.

Seattle—Demand continues active and several sizable projects are to be placed within 30 days. American Bridge Co., Pittsburgh, is low on 13,500 tons, for transmission towers, for Bonneville dam at $51,000. Bids are due Sept. 23 for additional 2000 tons. Interest centers in bids at Olympia, Wash. Sept. 27 for the Tacoma Narrows suspension bridge calling for about 15,000 tons of shapes, castings and cable.

San Francisco — Awards totaled 4549 tons, bringing the aggregate for the year to 102,604 tons, compared with 126,497 tons last year. Among the larger lots placed were 1192 tons, for the High street bridge, Oakland, Calif., taken by Moore Drydock Co., 400 tons of sheet piling for the same project, secured by Columbia Steel Co. Bids have just been opened on 686 tons for a bridge over the Santa Ana river near Prado, Calif., for Orange county.

St. Louis — Government projects predominate structural business. Large awards are absent, but numerous small jobs taking 10 to 50 tons enable fabricators to maintain 35 per cent operations. This rate has prevailed the past three weeks.

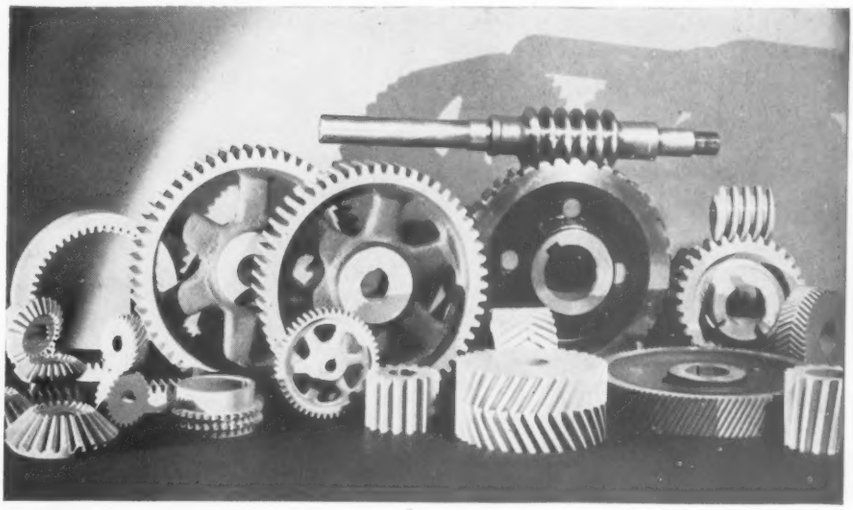
Shape Awards Compared

	Tons
Week ended Sept. 24	13,065
Week ending Sept. 17	74,830
Week ended Sept. 10	18,088
This week, 1937	10,614
Weekly average, year, 1937	23,251
Weekly average, 1938	18,972
Weekly average, August	28,101
Total to date, 1937	976,531
Total to date, 1938	739,898

Includes awards of 100 tons or more.

Shape Contracts Placed

1192 tons, including 156 tons machinery, High street bridge, Oakland, Calif., to Moore Drydock Co., Oakland, Calif.



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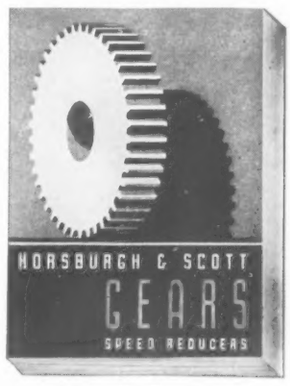

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860 tons, Eighth avenue bridge, Cedar Rapids, Iowa, to American Bridge Co., Pittsburgh.
800 tons, relocation of Lincoln highway viaduct, Irwin, Pa., to American Bridge Co., Pittsburgh.
750 tons, storehouse, Philadelphia navy yard, to Belmont Iron Works, Philadelphia.
750 tons, power house superstructure, Chickamauga dam, Tennessee Valley authority, Knoxville, Tenn., requisition 155288, to Stupp Bros. Bridge & Iron Works, St. Louis; bids Sept. 8.
680 tons, state hospital, Wahjamega, Mich., to Whitehead & Kales, Detroit.
650 tons, bridge, South Ashland avenue and Forty-ninth street, Chicago, to Bethlehem Steel Co., Chicago.
650 tons, high school addition, Malden, Mass., to New England Structural Co., Everett, Mass.; Rugo Construction Co., Boston, general contractor, $943,774; bids Aug. 18.
510 tons, Miami canal bridge, Miami, Fla., to Nashville Bridge Co., Nashville, Tenn.
425 tons, state bridge over Des Moines river, Keosauqua, Iowa, to Clinton Bridge Co., Clinton, Iowa.
400 tons, sheet piling, High street bridge, Oakland, Calif., to Columbia Steel Co., San Francisco.
350 tons, three army warehouses, Fort Lewis, Wash., to Ingalls Iron Works, Birmingham, Ala.; Allen & Early, Tacoma, general contractor.
310 tons, state bridge, project RC-3986, Waverly-Lockwood, Tioga county, New York, to Lackawanna Steel Construction Co., Buffalo, Lane Construction Co., Meriden, Conn., general contractor, $176,298.50; bids Sept. 7, Albany.
300 tons, addition, high school, Kearny, N. J., to Albert Smith's Sons, Irvington, N. J.; bids Sept. 14.
292 tons, three warehouses, McChord field, Fort Lewis, Wash., to Star Iron & Steel Co., Tacoma, Wash.
270 tons, sheet piling, first crossing of Los Angeles river for Southern Pacific Co., Los Angeles, to Columbia Steel Co., San Francisco.
230 tons, Schiller school, Pittsburgh, to Pittsburgh Bridge & Iron Co., Pittsburgh.
225 tons, dormitory, Greystone Park sanitorium, New Jersey, to Oltmer Iron Works, Jersey City, N. J.
225 tons, Houston hall, University of Pennsylvania, to Belmont Iron Works, Philadelphia.
215 tons, Crooked creek dam, Ford City, Pa., to Fort Pitt Bridge Works, Pittsburgh.
211 tons, Russian river bridge, Sonoma county, California, for state, to Judson-Pacific Co., San Francisco.
200 tons, bridge, South Western avenue and Thirty-first street, Chicago, to Bethlehem Steel Co., Chicago, by Midwest Construction Co.
190 tons, power house extension, for Great Northern Paper Co., Mattawamkeag, Me., to Megquier & Jones, Portland, Me.
180 tons, state bridge, Cumberland county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.
175 tons, school, Bernards, N. J., to Selbach-Meyer Co., Union City, N. J.
165 tons, 17 transmission towers, Texas, Lower Colorado river authority, to Muskogee Iron Works, Muskogee, Okla.
155 tons, warehouse, Lowry field, Denver, to Midwest Steel & Iron Co., Denver; Madsen Construction Co., Minneapolis, general contractor.
140 tons, warehouse, Burbank, Calif., to Bethlehem Steel Co., Los Angeles.
135 tons, bridge, FAP-104, Leake county, Mississippi, to Stupp Bros. Bridge & Iron Works, St. Louis.
130 tons, state highway bridge over Reading railroad, Philadelphia, to Bethlehem Steel Corp., Bethlehem, Pa.
125 tons, five oil derricks, Standard Oil Co., Union Oil Co. and Petroleum Co., Montebello, Calif., to unnamed interests.
125 tons, five oil derricks, General Petroleum Corp., Long Beach, Calif., to unnamed interest.
120 tons, alterations, bascule bridge, Neponset river, Neponset, Mass., to Groisser & Schlager Iron Works, Boston.
115 tons, school addition, Yeadon, Pa., to American Steel Engineering Co., Philadelphia.
110 tons, bridge 3718, Oconto county, Wisconsin, to Worden Allen Co., Milwaukee.
105 tons, bridge FAS-7B, Chippewa county, Wisconsin, to Worden Allen Co., Milwaukee.
100 tons, gymnasium, Wayne, Pa., to Morris Wheeler & Co., Philadelphia.
100 tons, bridge, Jackson Hollow, Chemung-Schuyler counties, New York, to American Bridge Co., Pittsburgh; J. F. Morgan Co., Whitney Point, N. Y., general contractor, $49,982.75; bids Sept. 7, Albany.
100 tons, state bridge, Montague-Sunderland, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; D. O'Connell's Sons Inc., Holyoke, Mass., general contractor.
100 tons, sheet piling, highway work, Monterey county, California, for state, to Columbia Steel Co., San Francisco.
100 tons, fire station and tower, Bayonne, N. J., to Selbach-Meyer Co., Union City, N. J.
100 tons, bridge, Cranston, R. I., to American Bridge Co., Pittsburgh.

Shape Contracts Pending

13,500 tons, transmission towers, Bonneville dam; Bethlehem Steel Co., Bethlehem, Pa., low.
2000 tons, pier shells, Tacoma, Wash.; closing Sept. 27.
2000 tons, state industrial school, Whitehill, Pa.; bids Oct. 14.
1350 tons, navy yard, Charleston, S. C.; bids Sept. 28.
1250 tons, west approach to Main street bridge, Cleveland; Sam W. Emerson Co., Cleveland, general contractor, also includes 1500 tons of bars.
900 tons, post office, Providence, R. I.
700 tons, machine shop, Philadelphia navy yard; bids Oct. 4.
675 tons, grade crossing eliminations, Pennsylvania railroad, Woodbridge, N. J.; James Stewart & Co., New York, low, bids Sept. 16, to A. C. Watson, chief engineer, New York zone, Pennsylvania station, New York.
650 tons, five bridges, state of Wisconsin, scattered locations; bids Oct. 4.
600 tons, bridge, two 184-foot truss spans, Westfield, Mass.; bids Oct. 3 to city.
500 tons, storehouse, Philadelphia navy yard; bids Oct. 30.
460 tons, extension to machine and structural shops, navy yard, Charleston, S. C.
400 tons, reconstruction of Herr's Island bridge, Pittsburgh.
400 tons, state highway bridge, Fairfield, O.
350 tons, factory building, for Clorox Chemical Co., Chicago.
350 tons, Lakeview housing project, Buffalo; John W. Cowper Co., Buffalo, low.
350 tons, bridge over Olentangy river, Columbus, O., for Franklin county, Ohio.
325 tons, municipal garage, Cambridge, Mass.
300 tons, addition to Lockport city hospital, Lockport, N. Y.; bids Oct. 7.
300 tons, high school addition, Wyomissing, Pa.; Edward A. Reider, Reading, Pa., low on general contract.
250 tons, state bridge, Bucks county, Pennsylvania; bids Sept. 30.
210 tons, trade school, Springfield, Mass.
200 tons, Hanson avenue bridge, Little Falls, N. Y.
205 tons, underpass, Fourth street, Ft. Sumner, N. Mex.
200 tons, factory building, Weldrods Inc., Cuyahoga Heights, O.; bids Sept. 28.
200 tons, state bridge 5593, Duluth, Minn.
200 tons, garage, Ft. Devans, Mass., for U. S. government.
190 tons, state bridge over Patapsco river, North Branch, Md.
175 tons, registrars building, Jamaica, N. Y., for United States treasury department.
170 tons, home for aged, Hamburg, N. Y.; bids Oct. 4.
155 tons, bridge, South Seventieth street, Milwaukee, for city.
153 tons, Sutter Slough bridge, Sacramento county, California; bids Oct. 3.
130 tons, high school, Ashtabula, O.; George Whike, Canton, O., general contractor.
125 tons, state bridges, Maine; bids Oct. 5, L. D. Barrows, chief engineer, state highway commission, Augusta.
125 tons, laboratory building No. 60, Pearl River, N. Y., for American Cyanamid Co.
120 tons, state bridges, Blackhawk, Colo.
120 tons, fish hatcheries, Leavenworth, Wash.; American Bridge Co., Pittsburgh, low.
110 tons, superstructure bridge No. 458, Oconten county, Wisconsin; Worden-Allen Co., Milwaukee, low.
100 tons, superstructure bridge No. 497, Chippewa county, Wisconsin; Worden-Allen Co., Milwaukee, low.
100 tons, shapes and bars, 88-foot plate girder bridge, Wait river, U. S. route 5, Bradford, Vt.; bids Oct. 7, H. E. Sargent, commissioner of highways, Montpelier.

Reinforcing

Reinforcing Bar Prices, Page 65

Pittsburgh — Bar awards are heavier, including a number of contracts pending for an extended period. Closing on some business is attributed to stronger prices, some of the low quotations named for a number of months beginning to disappear, particularly on larger projects. Among local inquiries is 500 tons for the Thirty-third street sewer.

Cleveland—Excluding the west approach to the Main street bridge, Cleveland, involving 1500 tons, for which Sam W. Emerson Co., Cleveland, is low for the general contract, reinforcing bar demand here is restricted to small lots for a few schools and a scattering of minor private projects. A bridge in Pickaway county, Ohio, will take about 400 tons. Prices remain weak on most fabricated work.

Chicago—Activity in concrete bars is bolstered by a large number of inquiries for lots of less than 100 tons. Such work includes many private projects as well as PWA construction and other forms of public works. New inquiries include 500

tons for a reservoir, Rock Island, Ill. Heading prospective private business is a large building program at Fiftieth street and East End avenue, Chicago, involving 11 apartment structures.

Boston—Contractors are slow to close on pending contracts for reinforcing bars, approximating 3000 tons. Public works account for practically all inquiries, with current buying usually limited to small tonnages. Prices are easy and under pressure from buyers who in some instances are holding out for larger concessions.

New York—Foundations for the criminal court building, New York, bids in and taking 725 tons, is the largest new reinforcing steel project with the exception of the Queensbridge housing job, 5250 tons. Contracts are fewer and smaller with prices soft. An outlaw strike by truckmen in New York during the week held up deliveries on considerable steel. Awards include 280 tons, building, Central Islip hospital, New York, to Bethlehem Steel Co., Bethlehem, Pa.

Philadelphia—New bids will be closed Oct. 14 on 500 tons for the state industrial school, Whitehill, Pa. However, serious doubt prevails if the security prison at Mt. Gretna, involving 1800 tons, will be revived. Recent buying is spotty with some state road work on which general contracts have been let is slow in closing.

Seattle—Estimators are figuring many small projects, mostly schools and other public buildings involving tonnages of 20 to 50 tons each. The total tonnage pending is greater than in several months. Reclamation bureau has awarded Bethlehem Steel Co. 3817 tons for the Coulee dam, the order to be rolled at the Seattle plant. General Construction Co. has the award for the Puget Sound graving dock project, involving 1300 tons.

San Francisco—Awards were the fifth largest of any week this year and aggregated 6446 tons, bringing the total to 102,077 tons as compared with 75,419 tons in 1937. Awards placed so far exceed the total of 101,421 tons placed in 1937. The metropolitan water district, Los Angeles, will open bids on Oct. 4 for close to 4800 tons for a 50-inch precast reinforced concrete pipe line. Pending business exceeds 16,000 tons while over 3500 additional are involved in placing projects only.

Concrete Bars Compared

	Tons
Week ended Sept. 24	5,113
Week ended Sept. 17	12,823
Week ended Sept. 10	17,114
This week, 1937	7,621
Weekly average, year, 1937	6,061
Weekly average, 1938	6,415
Weekly average, August	9,892
Total to date, 1937	250,686
Total to date, 1938	250,176

Includes awards of 100 tons or more.

Reinforcing Steel Awards

396 tons, bureau of reclamation, invitation B-47,252-A, Antioch, Calif., to Bethlehem Steel Co., San Francisco.

370 tons, United States hospital, Springfield, Mo., to Missouri Rolling Mills, St. Louis, through Henke Construction Co., contractors.

314 tons, highway work, Mariposa county, California, for bureau of public roads, to Soule Steel Co., San Francisco.

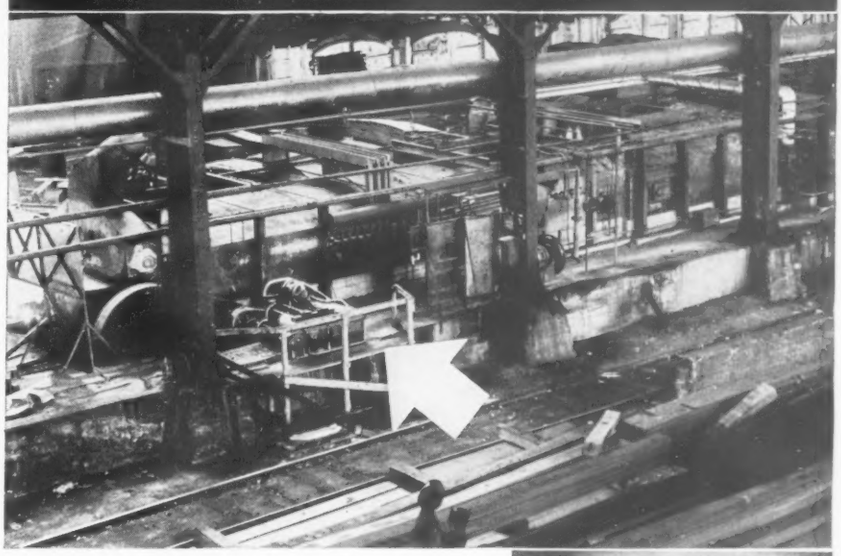
280 tons, patients' building, Central Islip state hospital, Long Island, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., New York, general contractor.

260 tons, state office building, Madison, Wis., to Truscon Steel Co., Youngstown.

250 tons, filtration plant, Evansville, Ind., to Laclede Steel Co., St. Louis.

228 tons, crossing, Pinole, Contra Costa

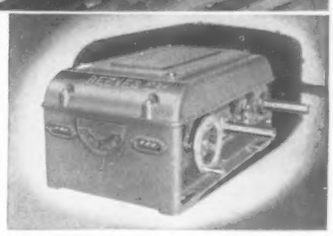
NEW UNIFORMITY IN NORMALIZING RUNS



• Primarily to overcome objectionable fluctuation of speed due to heavy loads imposed on d. c. power lines by other plant equipment, a REEVES VARIABLE SPEED TRANSMISSION was installed on the normalizing furnace pictured above.

Other advantages became instantly apparent.

Not only did the REEVES, operating on a. c., provide absolute uniformity of speed, without line-drop, speed drop—but *more accurate setting* of speeds and ease of adjustability contributed, also, to the better quality of finished products. Economy, too, was a factor. The cost of running d. c. lines to the job was eliminated, and a considerable conversion loss was saved. Maintenance costs were greatly reduced.



The modern enclosed design REEVES *Variable Speed Transmission. Accurate and positive!*

REEVES ENCLOSED DESIGN TRANSMISSIONS are rapidly replacing other speed control methods in steel plants everywhere. Unaffected by power line loads, by dust, moisture or temperature, they render silent, positive, accurate transmission of speed to driven machines for maximum efficiency at minimum cost.

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REEVES PULLEY CO. • *Dept. SL* • COLUMBUS, INDIANA

REEVES SPEED CONTROL

Behind the Scenes with STEEL

The One In The Center

■ Industrial advertisers got together last week here in Cleveland for three days of facts, figures and Fortey's fun. Warner & Swasey's Harry Fortey, who is often called industrial advertising's most handsome gent, went completely to town in providing entertainment which was tops. He is also a great hand at entertaining himself and this little shot shows Mrs. F. and friend posing with Harry. He swears

up and down the friend weighed more than he does and that it took something over an hour to coax him out of the Gulf and up in front of Barney's place to pose. And thus do we declare open a Fish Contest with Mr. Harry Fortey's 140 lb. tarpon in the lead. Anyone with a better fish story and acceptable proof will be presented with one crisp "fin".

Allen Tells All

■ Last week we turned the spotlight on STEEL's well-known and widely-read feature, Mirrors of Motordom, and apparently the glare reflecting off the bi-focals of Detroit editor, A. H. Allen did things to him. For years we have been bombarded with questions of how does he do it, where does he get all the inside dope, and who is this guy Allen. Now he has broken down and in an exclusive interview he tells all. Allen speaking: They ask me how I do it—and I tell them it's all done with MIRRORS. They then let fly at me with inkwells and die-cast zinc ashtrays—and I ducks. But to all who would like to take a gander behind the scenes to learn how Mirrors Of Motordom is compiled each week, give ear. I now have working for me 64 small brown men, operating in squads of 8, who are dispatched each morning through the General Motors building, the Fisher building, the downtown section, and various plants in this territory. These brown men do not carry swastikas, but they do carry large butterfly nets, with which they unerringly lunge at and trap all juicy tidbits of news they come across. After six hours of lunging and trapping, these little brown men report back to headquarters and disgorge their day's catch. The tidbits are placed in a delouser and travel on a continuous automatic conveyor past an electric eye which separates the pearlite from the goniffs, the former then passing on to a preheated digester of 18-8 stainless steel with tapered roller bearings and variable speed control. An oscillating agitator then comes into play and in about three hours the liquid miasma is tapped for subsequent transformation into copy. From there on it's simple, and as you note (Allen still speaking) my part is insignificant. Most of my time is spent keeping harmony among the brown men and preventing them from joining the CIO and starting a spit-down strike.

The Mat Is Out

■ We wish you all (bragging again) could have come over to our open house last Friday and been taken behind the scenes literally to see STEEL and the other Penton publications going to press. Just as we enjoy a chance to learn more about your business, everyone seemed to feel that way about getting a good whiff of printers ink. So, whenever you're within a good stone's throw make it a point to drop in and we'll have another open house just for you.

SHRDLU

county, California, for state, to Gunn, Carle & Co., San Francisco.

200 tons, bridge, Eighth avenue, Cedar Rapids, Iowa, to Joseph T. Ryerson & Son, Chicago, through Koss Construction Co., contractors.

200 tons, bridge, FAP-21-(8)-6, Eufaula, Okla., to Sheffield Steel Corp., Kansas City, Mo.; Moran & Buckner Co., contractors.

180 tons, sewage disposal plant, Ypsilanti, Mich., to Joseph T. Ryerson & Son, Chicago.

175 tons, building, Wilder Grain Co., Cedar Rapids, Iowa, to Inland Steel Co., Chicago, through J. S. Metcalf Co., contractor.

170 tons, building, Roth Packing Co., Waterloo, Iowa, to Sheffield Steel Corp., Kansas City, Mo., through Pittsburgh-Des Moines Steel Co., Des Moines, Iowa; W. A. Klenger Inc., contractor.

170 tons, New Central school, Glencoe, Ill., to Olney J. Dean Steel Co., Chicago; Coath & Goss, contractors.

156 tons, bureau of reclamation, invitation 21,113-A, Bramwell, Utah, to Colorado Fuel & Iron Co., Pueblo, Colo.

155 tons, addition to courthouse, Redwood, Calif., to Bethlehem Steel Co., San Francisco.

153 tons, bureau of reclamation, invitation 21,107-A, Bramwell, Utah, to Columbia Steel Co., San Francisco.

150 tons, Emerson high school, Los Angeles, to unnamed interest.

150 tons, Ruby dam project, Seattle city light department, to Bethlehem Steel Co., Seattle; General Construction Co., Seattle, general contractor.

150 tons, bridge over Lafayette river, Twenty-sixth street, Norfolk, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Tidewater Construction Co., Norfolk, Va., general contractor.

148 tons, bureau of reclamation, invitation B-42,210-A, Calexico, Calif., to Columbia Steel Co., San Francisco.

120 tons, addition to Municipal Utility building, Long Beach, Calif., to unnamed interest.

120 tons, school addition, Yeadon, Pa., to American Steel Engineering Co., Philadelphia.

110 tons, East river drive, contract 2, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Madden & Lane, contractors.

108 tons, addition to courthouse, Sacramento, Calif., to Ceco Steel Products Corp., San Francisco.

100 tons, grain elevator, Fleischman Malting Co., Milwaukee, to Laclede Steel Co., St. Louis; McKinzie-Hague, contractors.

100 tons, Olympia, Wash., armory and miscellaneous, to Bethlehem Steel Co., Seattle.

100 tons, post office, Richmond, Calif., to W. S. Wetenhall Co., San Francisco.

100 tons, joists and laths, high school, Wyomissing, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

Reinforcing Steel Pending

4784 tons, 50-inch reinforced concrete pipe, metropolitan water district, Los Angeles, specification 283; bids Oct. 4.

1450 tons, Lake street tunnel, San Francisco; bids opened.

1366 tons, procurement division, United States treasury department, Boston.

1300 tons, Puget Sound graving dock; General Construction Co., Seattle, general contractor.

725 tons, foundations, criminal courts building, New York; bids in.

600 tons, addition to 7-story warehouse, naval base, San Diego, Calif.; specification 8911; bids Sept. 29.

575 tons, Calvin Coolidge school, Washington.

500 tons, Allan Hancock Foundation building, University of Southern California, Los Angeles; general contract awarded to P. J. Walker Co.

500 tons, grade crossing eliminations, Pennsylvania railroad, Woodbridge, N. J.; James Stewart Co., New York, general contractor; bids Sept. 16.

500 tons, sewer, Thirty-third street, Pittsburgh.

500 tons, water reservoir, Rock Island, Ill.

450 tons, girls Catholic high school; bids in.

400 tons, bridge, Pickaway county, Ohio; bids soon.

380 tons, building, Froedert Grain & Malting Co., Winona, Minn.

325 tons, mostly mesh, state highway project RC-3989, Saranac Lake, N. Y.; bids Oct. 4.

300 tons, barracks, Ft. Bevan, Ayer, Mass.

280 tons, building, Froedert Grain & Malting Co., Milwaukee.

235 tons, addition to Dwight Edwards Co. plant, San Francisco; general contract to Cahill Bros.

170 tons, building, Wilder Grain Co., Cedar Rapids, Iowa.

160 tons, building, Perfection Biscuit Co., Ft. Wayne, Ind.

150 tons, state highway project RC-8522, Homer, N. Y.; bids Oct. 4.

140 tons, state highway project RC-3991, Penn Yan, N. Y.; bids Oct. 4.

140 tons, state road work, Delaware county, Pennsylvania; Skelley Construction Co., Media, Pa., general contractor.

129 tons, highway work, Washoe county, Nevada, for state; bids Sept. 29.

125 tons, state farm, Mutual Insurance Co., Bloomington, Ind.

120 tons, state road work, Bucks county, Pennsylvania; C. L. Milter, Pottsville, Pa., general contractor.

110 tons, state road work, Bucks county, Pennsylvania; H. R. Miller, Lancaster, Pa., general contractor.

100 tons, Church of Christ, Minneapolis.

100 tons, Mankato Teachers college, Mankato, Minn.

100 tons, armory, Olympia, Wash.; general contract to A. F. Mowat, Seattle.

100 tons, or more, Yakima county, Washington, 600-foot span; West Coast Construction Co., Seattle, general contractor.

100 tons, state library building, Cheney, Wash.; J. T. Hallin, Spokane, general contractor.

Unstated, 48 concrete stop logs, for Bonneville dam; bids to United States engineer, Bonneville, Oct. 6.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—Local producers have followed the lead of Interlake Iron Corp. in advancing pig iron prices $1 a ton, effective Sept. 27. New business has spurted as a result of the increase, although some consumers previously had contracted for sufficient tonnage to cover a large part of their fourth quarter needs. Decline of producers' stocks is reflected in the blowing in of another merchant furnace, giving the district a total of 16 active stacks. The Globe, O., producer has advanced silvery iron $1 a ton, also effective Sept. 27.

Cleveland—Local producers have advanced pig iron prices $1 a ton, effective Sept. 27, thereby giving a moderate stimulus to sales. Releases against old contracts continue slightly heavier than a month ago, a gain of 10 per cent being indicated for September. Best gains lately come from makers of heating appliances, though needs of automotive foundries also are tending upward. Railroad requirements are unchanged at a low rate.

Chicago — Pig iron prices have been advanced $1 a ton, effective Sept. 27, on all grades. This will make No. 2 foundry and malleable $21, furnace, restoring part of the $4 reduction made nearly three months ago. The increase has stimulated new business, consumers previously having been slow to cover forward needs because of expectations that prices would be reaffirmed for fourth quarter. While shipments are improving at a slower rate than during the past two months, a definite gain for September is indicated.

New York—Some protective covering by pig iron consumers has followed indications of eastern blast furnaces that they would follow the increase of $1 a ton in prices instituted by Midwest producers. The fact that the melt still is limited, however, is seen as restricting forward buying somewhat.

Philadelphia—Despite absence of formal action, most eastern pig iron producers indicate they will advance prices $1 a ton. Meanwhile some protective covering is in process which will probably be sufficient to raise booking for the month definitely ahead of August.

Buffalo — Hanna Furnace Corp. has announced an increase of $1 a ton in pig iron prices, effective Sept. 27. Producers are not expected to feel the benefits of the upturn to any large extent until next year, since iron booked at the old market in some cases will not be shipped until then. Deliveries this month have been fairly well sustained, and the outlook is regarded more favorably. Demand largely is of a miscellaneous nature.

St. Louis—Pig iron buying has been stimulated somewhat by the recent price advance, although shipments have tapered. Heavy buying several months ago leaves some of the larger melters with considerable iron due them against old contracts.

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WASHERS—PLAIN, SPRING, SPECIAL
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613 CENTRAL AVE., PONTIAC, MICH.

Jobbing plants are becoming busier, while some farm equipment manufacturers plan to increase operations steadily during coming weeks.

Birmingham, Ala.—Pig iron production has shown a consistent increase since the upward tendency became pronounced early in this quarter. Yard stocks have been greatly reduced and heavy business has been booked, although there still remains the necessity for shipping instructions on much of this business. Fourteen furnaces are in blast and at least one or possibly two probably will be added around Oct. 1. Southern producers have advanced prices $1 per ton.

Toronto, Ont.—Business continues to improve, sales for the week being nearly 2000 tons, while shipments against contracts also are heavier. Demand ranges from 50 to 400 tons, all for spot delivery. Producers look for larger shipments to points on the Great Lakes where melters will take in supplies to carry them through the greater part of the Winter.

Scrap

Scrap Prices, Page 68

Pittsburgh—Scrap continues dull here. What little new business is appearing is from outside districts and in distress and small-lot tonnages. Buying locally has been at a standstill for an extended period. While lower prices are reported on small offerings, dealers holding larger quantities of scrap are reluctant to sell at current levels. Railroad specialties are less active, but small sales have been made at the current $17-$17.50 range.

Cleveland—While several important iron and steel scrap consumers are reported to be negotiating it is understood none of these negotiations have been closed. The most activity now apparent is shipping of some heavy steel, pressed sheets and lighter material in occasional lots to outside consuming points. Quotations are unchanged.

Chicago—Scrap prices are easier here, heavy melting steel being off 50 cents a ton on a sizable purchase by a district steelworks at $13.50. A number of other grades, including compressed sheets and railroad steel specialties, also are quoted lower. Weakness in the market coincident with an advance in pig iron is in contrast to the situation three months ago when scrap was rising rapidly in the face of a $4 cut in pig iron.

New York — Scrap prices are steady, with heavy breakable slightly firmer, brokers offering $11.50 to $12 f.o.b. for domestic shipment. Demand for export is well sustained following recent additional purchases, but prices for barge delivery are unchanged. Domestic demand is spotty. While eastern mills in several instances are taking shipments, new buying is conservative.

Philadelphia — Heavy breakable cast has advanced 50 cents a ton on sales to two district consumers, the market now being $16 to $16.50. Strength is attributed in part to the buoyant tendency in pig iron. Other grades are unchanged, with domestic demand generally quiet. For the first time in weeks, however, interest in export scrap has revived, with $13.50 and $12.50, port, being quoted on No. 1 and No. 2 steel, respectively. Japan is reported releasing tonnages against old contracts, while Italy is taking scrap against an order announced early this month. Since relatively little tonnage probably will be handled here, this is expected to have no material effect on the local domestic market.

Buffalo—Scrap prices are surprisingly steady, considering the absence of buying interest. Dealers continue to quote heavy melting steel $14 to $14.50 for the No. 1 grade, although no sales have been reported at this range in a month. Mills are cutting into stocks, and some buying is expected shortly if steelmaking holds at its current level. Inventory of the leading consumer still are regarded as sizable, however.

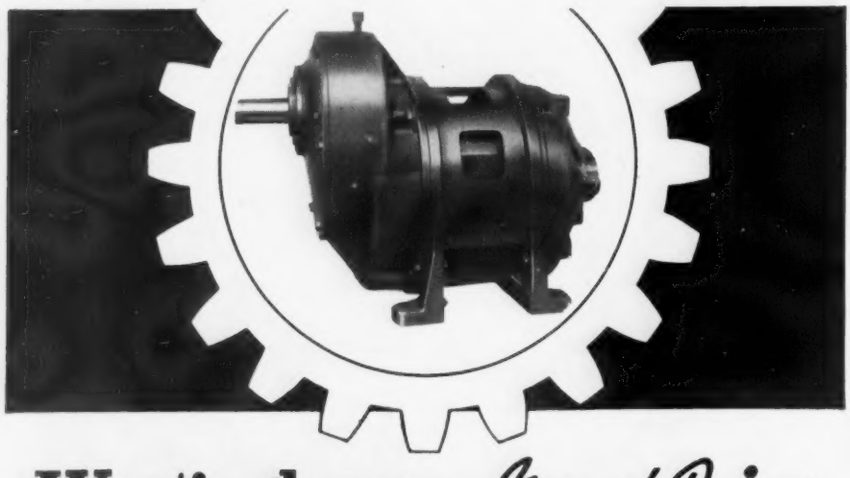
Detroit — Dealers are attempting to determine whether the continued absence of scrap buying will mean pressure on prices, many being of the opinion weakness will develop, especially in borings and turnings. Bundles and busheling are the only grades to move in any volume and are stronger, the former being up 50 cents and the latter 25 cents a ton.

Cincinnati—Scrap prices are unchanged here in a lifeless market. Dealers are cautious regarding an increase in yard stocks which were reduced early this summer on coverage of mill commitments. Mills lately have not been interested in heavy buying, although consumption has been fairly heavy and is thought likely to increase further next quarter.

St. Louis — Iron and steel scrap prices here are unchanged, except for an advance of $1 a ton on short steel rails. Consumer buying is quiet, but some is looked for early in October, and in the meantime shipments against old contracts are heavy. Dealers remain active in covering previous orders, with a sizable short interest prevailing, particularly in No. 2 steel. Country scrap is coming out more slowly.

Birmingham, Ala.—Scrap, despite an increase of $1 a ton in pig iron, remains comparatively inactive. The district's largest user currently is out of the market. Prices are nominal.

Seattle—Local mills have re-entered the market for small tonnages, paying $10 for No. 2 steel which is moving rather slowly from



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interior points. Export demand is quiet, only small lots being forwarded from this district. Larger quantities are being shipped from Los Angeles. The export price for No. 1 steel nominally is $12 to $12.50, but in the absence of sales, dealers are hesitant to name figures. Japan is reported to have placed new business, but exporters are awaiting credits before shipping. A local dealer is said to have purchased 3000 to 4000 tons of used sheet piling salvaged at Coulee dam.

Toronto, Ont. — Scrap demand, while improving, is spotty. Heavy melting steel is one of the most active items, and dealers are shipping to mills whatever supplies are available. Railroads are expected to move large tonnages into the market the balance of the year. Machinery cast is in good demand but in light supply, stove plate has a ready market and sales of wrought scrap are heavier.

Britain Glutted with Scrap; Sells to Europe

■ Heavy excess stocks of scrap metals, particularly steel and iron, have developed recently in Great Britain, according to the American commercial attache in London. The British press states that heavy shipments are being made to foreign markets and recently more than 20,000 tons were exported to Germany in one week. It is also stated the steel industry's requirements in scrap are covered for some time to come and no purchases from the United States are contemplated by British interests at present.

Scrap imports for seven months totaled 603,251 tons, compared with 486,976 tons in the corresponding period last year.

Warehouse

Warehouse Prices, Page 67

Pittsburgh—Business this month gives indications of setting a new peak for the year to date, although volume still is far from satisfactory. Little hope is held for good demand before the end of the year.

Cleveland — Size and number of warehouse orders have improved moderately, and a 10 to 15 per cent gain in shipments this month over August is anticipated. Recent gains are well diversified. Continuation of present prices into next quarter appears assured by reaffirmation of mill quotations.

Chicago — Despite the holiday slump early this month, sales to date in September are slightly ahead of August. The gain is expected to continue through the balance of the month. Price changes next quarter are thought likely to be limited principally to track materials.

Philadelphia—Business is somewhat disappointing in doing little more than holding its own with August. Prices are fairly steady.

Buffalo — Improvement in warehouse sales is spotty, though total business this month is slightly ahead of August. Demand is largely from miscellaneous users, with heavy products inclined to lag.

Cincinnati—Sales this month may show a gain of 10 per cent or more over August. Steady industrial needs are augmented by demand from coal mines and a sizable tonnage of small orders for building materials. Sheet prices have been clarified by the recent adoption of new quotations to conform to the Middletown base.

St. Louis—Sales by warehouses continue heavier than in August. Demand is well diversified, with heavy products more active than a few weeks ago. Strip buying is definitely improved, while wire and wire products are moving better.

Seattle — Hesitant demand has dropped warehouse volume so far this month below August. Awarding of numerous contracts, financed by PWA funds, is expected to stimulate activity next month. Sheets continue in best demand. Prices here are steady, but concessions are reported in the Portland area.

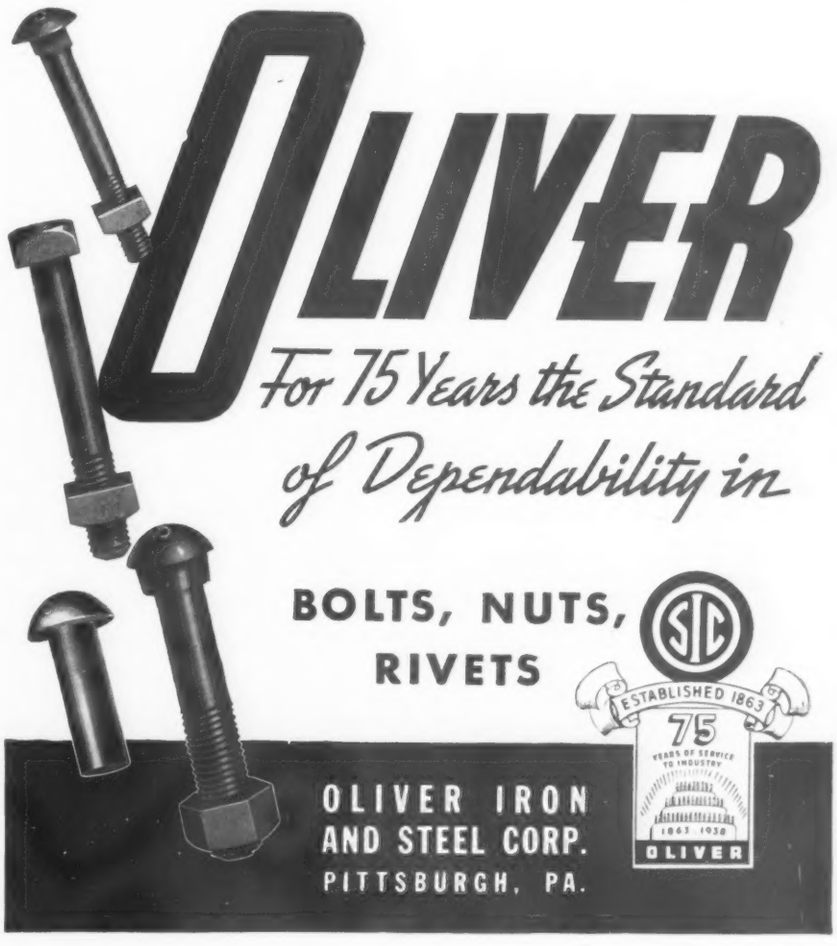
Steel in Europe

Foreign Steel Prices, Page 67

London — (*By Cable*) — More inquiry is coming out in the steel and iron market of Great Britain. Pig iron stocks are heavy but are diminishing slowly. General improvement is indicated for fourth quarter. Steel buying is slow and there is heavy stock of semifinished steel in all districts. Shipbuilding is quiet.

The Continent reports that the feeling is gaining that larger business will develop when the European situation clears. France has placed a ban on export of scrap and other war material. The Netherlands are importing semifinished steel from America.

Due to the international situation the British Iron and Steel federation's emergency committee has postponed consideration of steel scrap prices until its October meeting. It is understood the present scale will continue until that time.



Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Sept.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot. N.Y.	Nickel Cathodes
17	10.25	10.37½	9.77½	43.55	43.70	5.00	4.85	4.85	20.00	11.25	35.00
19	10.37½	10.50	9.90	43.70	43.85	5.10	4.95	4.95	20.00	11.25	35.00
20	10.37½	10.50	9.90	43.65	43.80	5.10	4.95	4.95	20.00	11.25	35.00
21	10.37½	10.50	9.90	43.70	43.95	5.10	4.95	4.95	20.00	11.25	35.00
22	10.37½	10.50	9.90	43.35	43.65	5.10	4.95	4.95	20.00	11.25	35.00
23	10.37½	10.50	9.90	43.25	43.50	5.10	4.95	4.95	20.00	11.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.37½c Conn. copper

Sheets

*Yellow brass (high) 16.87½
*Copper, hot rolled 18.50
Lead, cut to jobbers 8.25
Zinc, 100 lb. base 9.75

Tubes

*High, yellow brass 19.62½
*Seamless copper 19.00

Rods

*High yellow brass 12.75
*Copper, hot rolled 15.00

Anodes

*Copper, untrimmed 15.75

Wire

Yellow brass (high) 17.12½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York 6.32½-6.57½
*Cleveland 7.25-7.50
Chicago 6.37½-6.62½
*St. Louis 6.25-6.50

Heavy Copper and Wire

*New York, No. 1 .....7.87½-8.12½
*Cleveland, No. 1 .....8.00-8.25
Chicago, No. 1 .....7.87½-8.12½
*St. Louis 8.00

Composition Brass Borings

*New York 5.57½-5.87½

Light Copper

*New York 6.37½-6.62½
*Cleveland 6.25-6.50
Chicago 6.37½-6.62½
*St. Louis 6.00-6.25

Light Brass

*Cleveland 3.75-4.00
*Chicago 4.37½-4.62½
*St. Louis 4.25-4.50

Lead

New York 4.00-4.25
Cleveland 3.75-4.00
*Chicago 4.00-4.12½
*St. Louis 3.75-4.00

Zinc

New York 2.50-2.62½
Cleveland 2.25-2.50
St. Louis 2.75-3.00

Aluminum

Borings, Cleveland 6.25-6.50
Mixed, cast, Cleveland 8.75-9.00
Clips, soft, Cleveland 12.75-13.00
*Mixed cast, St. Louis 8.25-8.50

SECONDARY METALS

*Brass ingot, 85-5-5-5, less carloads 11.00
Standard No. 12 aluminum....13.75-14.25

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Iron Ore

Iron Ore Prices, Page 68

New York—Importers of foreign ore are withholding prices pending better clarification of the European situation. For the first time in several months they have been experiencing a flurry of inquiry, as domestic consumers attempt to sound out the market with a possible view to picking up tonnage should foreign affairs take a turn for the worse. Meanwhile, prices are purely nominal.

Cleveland — Consumption of Lake Superior iron ore during August totaled 2,076,819 tons, an increase of 402,098 tons over July consumption of 1,674,721 tons, according to the Lake Superior Iron Ore association. In August a year ago 5,373,264 tons were consumed. Stocks at lower lake ports and furnaces Sept. 1 were approximately 1,700,000 tons more than on the comparable date last year. The association's report follows:

	Furnaces	Docks	Total
Sept. 1....	31,758,819	5,291,519	37,050,338
Month ago	30,655,968	5,190,192	35,846,160
Year ago.	30,861,483	4,481,726	35,343,209

Reflecting the increased consumption of iron ore during August and the improved outlook for the remainder of the year, ten more Great Lakes cargo ships entered the ore trade during the 30 days ending Sept. 15, making a total of 106 in that trade. Of the 306 ships in the Great Lakes fleet, 142 are in commission, compared with 125 on Aug. 15. A year ago 307 ships of 311 in the fleet were engaged in the ore trade.

Nonferrous Metals

New York — Copper, tin, lead and zinc prices moved higher last Monday following the steady advance in London and heavy domestic demand. London markets firmed on the prospects for a peaceful solution of the Czech problem which in turn stimulated buying here on price protection. Buying was also for coverage in case war should break out and was justified by the steady improvement in actual consumption.

Copper — Electrolytic advanced to 10.37½c, Connecticut. Most allied products, including brass ingot, copper and brass mill products, and red metal scrap rose proportionately. A sharp reaction in London during the latter part of the week checked the buying movement but domestic prices held steady. Export copper closed at 10.27½c, c.i.f.

Lead — Prices advanced 10 points to the basis of 4.95c, East St. Louis, and 5.10c, New York. Sales were very heavy through Wednesday and

then tapered since September needs had been covered by about 85 per cent and those for October about 70 per cent. Refined lead stocks dropped 13,494 tons in August to 140,737, the smallest since February.

Zinc — Prime western advanced 10 points to 4.95c, East St. Louis. Buying was spotty with sellers restricting business to orders for delivery through the fourth quarter. Galvanized sheet output has risen to over 60 per cent of capacity, a new high since Oct. 23, 1937.

Tin — Prices fluctuated rapidly abroad but held between 43.35c and 43.70c on Straits spot here. Offerings were limited due mainly to uncertainties regarding war risk insurance rates.

Antimony — Buying was confined mostly to small lots. Prices held at 11.25c, New York, for American spot and nominally 14.00c, duty paid New York, for Chinese spot.

Ferroalloys

Ferroalloy Prices, Page 66

New York—Ferromanganese shipments continue to increase moderately, and sellers anticipate September will be the third consecutive month to show a gain in deliveries. The market is $92.50, duty paid, Atlantic and Gulf ports, a price recently reaffirmed for fourth quarter. Movement of spiegeleisen also is expanding slightly, with domestic material holding at $28, Palmerton, Pa. and 26 to 28 per cent $33. These prices also will prevail next quarter.

Prices on imported ferromanganese have stiffened materially as a result of Czechoslovakia's capitulation to demands of Germany. It is explained that Czecho ferromanganese recently has had a markedly depressing influence on prices of imported material and that now this has been withdrawn apparently for German consumption.

Cold-Finished

Cold Finished Prices, Page 65

Pittsburgh — Cold-finished bar prices have been extended into fourth quarter, with the exception that the former extra of $1 a ton on lead-bearing open-hearth bars has been advanced to $3. Cold bar finishers report a steady gain in automotive business and an even demand from most other consumers.

Semifinished

Semifinished Prices, Page 65

Pittsburgh—Orders for skelp and wire rods are moderately heavier, but billet and sheet bar demand is leveling off. The latter trend is regarded as a natural aftermath of heavy buying previously. Little stocking on the part of nonintegrated mills is reported.

New Scrap Firm Formed In Pittsburgh District

■ Steel Trading Corp. has been formed at Pittsburgh to deal in new and used iron, steel and nonferrous products. H. L. Berkman is president; Max Meltzer, vice president; and Louis Berkman, secretary and treasurer. Offices will be established in the Clark building, in charge of Mr. Meltzer. He has been engaged in the scrap business for 25 years with firms in New York, Philadelphia, Detroit and Pittsburgh, and on his own account in the Max Meltzer Co., Pittsburgh.

During the World war Mr. Meltzer was assistant to the chairman, scrap iron division, council for national defense. He was one of the founders of the Institute of Scrap Iron and Steel Inc. H. L. Berkman and Louis Berkman have had long experience as processors and dealers in ferrous and nonferrous materials. Both have been associated with the Louis Berkman Co., Steubenville, O.

■ Factory employment increased 4.9 per cent and payrolls 8.9 per cent in August over July, according to Secretary of Labor Perkins. August employment was 21 per cent below that for August, 1937, while payrolls were 29 per cent lower.

Business Appraises Economic Problems

(*Continued from Page* 14)

reducing the shock of technological changes, he said, such as retraining workers, gradual changeover to fit the normal turnover of personnel, pensions and unemployment insurance, efficient employment agencies for labor exchange co-operation between industries of a community to synchronize layoffs in one company with new employment in another.

Robert J. Watt, American workers' delegate to the international labor office, spoke on behalf of labor but asserted he was "talking simply as one labor leader." He said American labor wants to be recognized as "the partner of capital in production, as the customer of capital in distribution, as the majority voice in political democracy, and as the substantial center of our community life."

A highlight of Mr. Watt's address was the statement labor did not prefer to ask for "the shorter work week and higher wages" by government action. He added, however, there was general agreement, despite objections of the American Federation of Labor to administrative policies and practices of the national labor relations board, that Wagner act principles should be maintained as "the foundation for the adequate and effective organization of workers."

Declaring union responsibility in

At the Show . . . **NEW MANSAVER GRAB**
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its relationship with management would be forthcoming just as soon as workers are afforded a chance of developing "their own patterns of union discipline," Mr. Watt decried the idea of union incorporation as a "child of ignorant scheming," asserted registration of labor unions in Great Britain infers little more than the privilege of tax exemption, expressed belief importation of "a ready-made formula to legislate industrial peace" was impossible.

Asserting the middle class is the real owner of American industry, William Allen White, editor, the *Emporia* (Kansas) *Gazette*, said neither capital nor labor could thrive and prosper without middle-class support, warned progress might stand still unless steps were taken to achieve industrial peace "outside party politics."

He was emphatic in indicting both capital and labor for having failed to take advantage of past opportunities and for lacking proper appreciation of what the general public thinks and desires.

"If a dozen or twenty years ago you, Mr. Capitalist," he said, "had used the social sense of the average man in the street, this problem of unemployment and old age pensions would not be handing to your arch-enemies an organized subsidized class-conscious proletariat which can be voted to your destruction.

"What you got," he said, "when you silenced the voice of the American consuming public demanding justice, was the CIO and the labor racketeers, and the sitdown strike encouraged by the smiling and distinguished gentleman who holds the ace card in the political game. His lightest word of opprobrium for you enterprisers, large and small, in his quest for votes is 'economic royalists.'

Criticizes Labor and Capital

"And all capitalists, big and little, must listen and like it when he runs the gamut of invective against your kind. There's little you can do about it. Your friends were in power 20 years ago. And you chose to follow the counsel of reaction when the voices of the American people, if both party platforms mean anything, were calling for the establishment of genuine collective bargaining to give your country industrial peace with justice."

Mr. White was similarly sharp in his criticisms of labor.

"The blessed Lord knows that capital has made its mistakes and is paying for them, paying through the nose. But labor has been no Solomon. The proper business of a labor union is to get higher wages, better hours and good shop conditions for the workmen. But when labor enmasse plunks its vote for its own party, then the spirit of party loyalty begins to obscure labor's objectives—high wages, short hours, decent shop conditions.

"Thus class-conscious labor leaders become more interested in their party welfare than in the fundamental objectives of labor unions. So we shall have the class-conscious political worker trading his vote not for the immediate objective of wages, hours and shop conditions but for the power of his political labor boss.

"The political labor boss will ask the workers to swallow a whole ticket in order to dominate a whole government. He would turn a democracy into a contest between two class-conscious parties, a class-conscious proletariat and a class-conscious plutocracy."

Assistant Secretary of State, George S. Messersmith, read the speech of Secretary Hull who was unable to attend on account of the international situation.

He said "a gratifying indication of the increasing consciousness which modern management has shown of the broad scope of its responsibilities is attested by the assembling of this congress. You meet as friends from many lands to exchange ideas and to co-operate in mutually advantageous ways. Such exchange and co-operation is necessary and helpful to management in its earnest desire to conduct its affairs in the spirit of a public trust. The entire world is the gainer thereby."

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Equipment

Chicago — Sales of machine tools have taken a decided upturn and while it is scarcely hoped present volume can be maintained, indications are sales for the month will be higher than in August. Inquiries have not been much larger but bookings have risen greatly, especially when compared with last week's low volume. Most machine tool movement is reported to be within the Chicago district. Several large sized orders have been a feature of the betterment.

Seattle — Electrical equipment and pumping machinery demand is active. Seasonal requirements for road and mining machinery have passed the peak. Bids were opened at Denver by reclamation bureau for furnishing two 74,000-horsepower turbines for Coulee dam, S. Morgan Smith Co., York, Pa., being low at $1,584,144 and Woodward Governor Co., Rockford, Ill., low at $87,516 and $90,679, respectively, for furnishing governors. Dorr & Co., Los Angeles, will furnish digester equipment, clarifiers and other material for Seattle's Henderson street disposal plant. U. S. engineer, Bonneville, will open bids Oct. 14 for furnishing 15 kilovolt feeder circuit breakers. Puget Sound navy yard has called bids Oct. 3 for a 5-ton crane for Sand Point air base. Helena, Mont., opened bids Sept. 23 for a gas or diesel power shovel, trailer and dragline attachments.

Construction and Enterprise

Ohio

GARRETTSVILLE, O. — Village, Howard Knapp, mayor, has plans for construction of sewage disposal plant and has filed application with PWA for a grant; estimated cost $129,500. Barstow & Lefeber Inc., Akron, O., engineer, preparing report.

HAMILTON, O.—City, R. P. Price, city manager, plans to construct sewage disposal plant, including sewers, pump station, treating plant and retarding dam to cost $160,000. Application filed for PWA aid; city will probably vote on bond issue Nov. 8. Barstow & Lefeber Inc., Cincinnati, O., consulting engineer.

HILLSBORO, O.—Village, James McDermott, clerk, is drawing up plans for two sewage disposal plants and a gravity sewer system to cost approximately $350,000. Consulting engineers, Burgess & Niple, Columbus, O.

MONROEVILLE, O.—PWA has approved a grant to village, Clarence Zippel, mayor, of $35,182 on construction of a municipal light plant; equipment will include three diesel engines and a 5-ton crane. Cost estimated at $78,180. Engineers, W. C. Kammerer & Associates, Cleveland. (Noted July 4.)

NEW CONCORD, O. — Village, J. J. Smith, mayor, is preparing preliminary plans for construction of sewer system and disposal plant to cost $76,821; application filed with PWA for $34,500 grant. William Hillyer, village engineer.

NORTH BALTIMORE, O.—Hendock-Wood Electric Co-operative Inc., J. E. Shoop, president, has been allotted $181,000 by REA for rural electric power line construction.

PAINESVILLE, O.—City, C. S. Fullerton, city manager, is taking separate bids due at noon, Sept. 29, on electric power wiring connecting generators and new switchboard; power piping; two centrifugal boiler feed pumps; and other improvements to municipal light and power plant. Certified check requested for 10 per cent of amount of bid. H. R. Hadlow, 700 Prospect avenue, Cleveland, consulting engineer. (Noted July 11).

PIONEER, O.—Village, Charles Pilbeam, mayor, will vote at regular election Nov. 8 on previously defeated bond issue to finance construction of waterworks system; surveys now being made. Project will cost $67,273; PWA has approved a grant. Champe, Finkbeiner & Associates, Toledo, O., engineers.

TROY, O.—City, George Smith, service director, has received PWA grant of $79,074 and is proceeding with plans to construct a municipal light plant costing $175,720. Froehlich & Emery, Toledo, O., consulting engineers. (Noted Aug. 15.)

VERSAILLES, O.—City, Ralph Pittsenbarger, clerk, votes in November on bond issue for construction of sewage disposal plant to cost $129,000; application has been filed for grant with PWA. Work will include installation of blower, tanks, digestor and drying equipment in addition to building construction.

WEST SALEM, O.—Village, T. E. McKeown, mayor, is making survey for contemplated sewage system and disposal plant and will have report soon from consulting engineer, Barstow & Lefeber Inc., Akron, O.

Pennsylvania

GIRARD, PA. — Borough is planning an addition to its sewage treatment plant to cost $34,617; application has been filed with PWA. Consulting engineer, Hugh Nelson, Erie, Pa.

OIL CITY, PA. — Borough has filed application for a PWA allotment on construction of contemplated sewage-treating plant to cost about $650,000; Morris Knowles Inc., Pittsburgh, engineer.

UNION CITY, PA.—Borough plans to build water filtration plant costing about $65,370 and has filed an application for a grant with PWA. Consulting engineers, Hill & Hill, Northeast, Pa.

WILLIAMSPORT, PA. — City is making plans for construction of a sewage disposal and treating plant to cost nearly $1,000,000. L. Mussina, city engineer.

Michigan

DETROIT — Bohn Aluminum & Brass Co. has awarded general contract for constructing and equipping one-story furnace room, costing $40,000, to Kriegshoff Co., 6661 French road, Detroit.

FLINT, MICH. — Buick Motor division of General Motors Corp. plans installation of motors and controls, conveyors, electric hoists in proposed two-story addition to plant, 310 x 748 feet. Erection to start in early fall; total cost estimated at $450,000. (Noted Sept. 12).

MANISTEE, MICH. — City contemplates building a sewage disposal plant and is seeking PWA assistance.

SAGINAW, MICH.—City council proposes construction of sewage and garbage disposal plant to cost $3,800,000, and has filed application with PWA for an allotment of $1,750,000. Engineers Shoecraft, Drury and McNamee, Ann Arbor, Mich., are drawing plans.

SAULT STE. MARIE, MICH.—Cloverland Electric co-operative has received REA allotment of $427,000 for construction of 352 miles of power lines in Chippewa and Mackinac counties.

Massachusetts

HOPEDALE, MASS.—Draper Corp., manufacturer of textile machinery, is constructing two one-story additions to its plant, one 30 x 520 feet for foundry purposes, the other 30 x 130 feet for storage and distribution.

NATICK, MASS.—Natick Box and Board Co. is constructing two-story warehouse addition to its factory—60 x 100 feet—estimated to cost $40,000.

SPRINGFIELD, MASS.—Van Norman Machine Tool Co., manufacturer of milling machines and grinders, will build a one-story plant addition, 51 x 140 feet.

Rhode Island

BRISTOL, R. I.—Collins & Aikman Mills Corp. is planning construction of a small plant for treatment and disposal of industrial waste at estimated cost of $20,000.

New York

BUFFALO — Modern Heat Treating & Forging Co. is preparing to build a $40,000 heat treating plant; S. Feind, company engineer.

NEWBURGH, N. Y. — City proposes to build a sewage disposal plant costing about $800,000. T. F. Bowe, 110 William street, New York, engineer.

ROCHESTER, N. Y.—Petz & Raboid Tool & Die Co. has broken ground for its new one-story modern factory building of steel and tile.

New Jersey

PATTERSON, N. J. — Wright Aeronautical Corp. lets contract soon for construction of two-story, 200 x 250-foot assembly building at airplane factory; cost is $100,000. Albert Kahn Inc., Detroit, architect.

Indiana

DECATUR, IND.—REA has allotted $290,000 grant for rural transmission lines to Decatur Rural Electric Corp., B. H. Blankman, Greensburg, Ind., president.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take

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bids to Oct. 4 on an electric furnace (schedule 4379), and a power press (schedule 4409).

Kentucky

CARLISLE, KY.—REA has allotted $200,000 to Nicholas county, R. J. Matson, county agent, for construction of 150 miles rural lines.

ERLANGER, KY. — Kenton county water commission, Covington, Ky., rejected preliminary bids and is reaccepting bids until 11 a.m., Oct. 13, on waterworks improvements, including 500,000-gallon elevated tank and tower. Certified check for 5 per cent of bid; consulting engineer, J. Stephen Watkins, Lexington, Ky.

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Florida

NICEVILLE, FLA.—City will vote Sept. 28 on issuance of revenue debentures to finance proposed waterworks system, ice and cold storage plant; WPA has approved a grant on project. J. W. Windham is city clerk.

SANFORD, FLA.—City commission is seeking PWA grant of $175,000 and loans of $215,000 for construction of municipal electric plant and distribution system.

Georgia

BRUNSWICK, GA. — PWA has allotted a grant on sewage system improvements estimated to cost $40,000.

DONALSONVILLE, GA.—Three-Notch Electric Membership Corp. has received $300,000 PWA allotment in the construction of 279 miles rural power lines over four counties.

JACKSON, GA.—REA has granted an allotment of $303,000 to Central of Georgia Electric Membership Corp. for construction of 333 miles power lines in 12 counties.

ROME, GA.—WPA has allocated $132,000 for extensions of sewage system and work will start immediately.

Mississippi

CANTON, MISS. — PWA has authorized an allotment of $21,510 to city for construction of proposed additions and improvements to electric generating plant; estimated cost, $47,000.

GULFPORT, MISS.—City will vote Sept. 29 on $300,000 bonds for construction sanitary sewerage system and extension of waterworks; plans by Shaw & Woleben, Gulfport.

MERIDIAN, MISS. — City, C. Vinson, mayor, will be ready for bids soon on construction of an electric distribution system costing $1,242,000; PWA grant approved. Engineers, Lide & Adler, Birmingham, Ala. (Noted Aug. 1).

North Carolina

CHARLOTTE, N. C.—Hudson Silk Knitting Mills Inc. proposes to invest $1,000,000 in plant construction and equipment installations. Plans provide for completion by Nov. 1 of two modern one-story air-conditioned buildings.

DURHAM, N. C. — American Tobacco Co. contemplates erection of a five-story, steel and concrete addition to its manufacturing plant, 280 x 90 feet, to cost about $500,000. Sprinkler system will be installed.

GASTONIA, N. C.—PWA has approved grant to city for additions and improvements in its sewage works, pumping station and disposal plant costing $104,000.

GREENVILLE, N. C.—City has voted to issue $374,544 of bonds for proposed extensions of water and light system. (Noted July 4.)

KINSTON, N. C.—Caswell Training school has plans maturing for construction of one-story industrial building to cost $25,000; PWA has made allotment on project.

LENOIR, N. C. — City has received PWA grant of $112,000 for constructing $250,000 improvements to sewerage works and treatment plant.

RALEIGH, N. C.—City has voted favorably on a $385,000 bond issue to match a grant of PWA funds for a $700,000 waterworks enlargement program. (Noted Sept. 12.)

STATESVILLE, N. C. — PWA has approved grant on projected improvements to sewerage works and treatment plant to cost estimated $355,000.

WILSON, N. C.—Town, M. W. Wiggins, manager, has voted favorably on $165,000 bond issue for construction of sewage disposal plant.

South Carolina

LAURENS, S. C. — PWA has made $36,000 grant to city for improvements in waterworks, sewage works, treating plant and electric plant costing $82,000; equipment to be installed includes 438-kilovolt gasoline electric generator.

MONCKS CORNER, S. C.—Santee-Cooper power project will probably complete specifications soon for generating machinery, including hydraulic turbines and generators, five 40,000-horsepower turbines, and construction of powerhouse; bids will be called for. Harza Engineering Co., 27 Cumberland street, Charleston, S. C., engineer for project.

SPARTANBURG, S. C. — City has received PWA allotment of $281,250 for extensions to waterworks, water treatment plant, coagulating basins and filters; cost estimated at $625,000.

Tennessee

CAMDEN, TENN. — Benton county votes Oct. 1 on bond issue of $180,000 to provide county's share of cost of electric distribution system, cost estimated at $320,000. Will negotiate for purchase of Benton county properties of Tennessee Light & Power Co.

CHATTANOOGA, TENN. — Electric Power board, S. A. Finley, chief engineer, will receive bids after Oct. 11 for manufacture and delivery of sub-project contract No. 4-B, underground network transformers; estimated cost $150,000.

CLARKSVILLE, TENN.—Cumberland Electric Membership Corp., C. V. Runyon, legal representative, has $245,000 allotment to construct first unit of 225 miles TVA lines in four counties.

KNOXVILLE, TENN.—City has let contract to Burford, Hall & Smith, 140 Edgewood avenue, N. E., Atlanta, Ga., for $81,424 worth of electrical pumping equipment for city's water plant.

TIPTONVILLE, TENN.—PWA has approved loan and grant to city, A. E. Markham, mayor, for construction of electric distribution system to cost $120,000; L. O. Brayton, Dyersburg, Tenn., is consulting engineer. (Noted Aug. 29).

Louisiana

GRETNA, LA.—Board of supervisors, sewerage district 1 of Jefferson parish, proposes to construct complete new sewage disposal plant costing estimated $1,001,416; PWA has allotted $450,979. G. P. Rice, New Orleans, engineer.

LAFAYETTE, LA.—City plans increased facilities at light and water plant, including additional generating unit, to cost total of $163,000; will apply to PWA for $73,000 grant. J. F. Ard, plant superintendent.

WELSH, LA.—City has PWA grant of $57,000 for construction of sewerage works, pumping unit, settling tank, sludge digestion tank, sludge drying beds, sewage lift station and pumping equipment. Cost estimated at $126,784.

West Virginia

CEDAR GROVE, W. VA.—PWA has authorized loan and grant to city for construction of waterworks with filter beds, sedimentation tanks and chemical feed machines. Cost estimated at total of $25,000.

CHARLESTON, W. VA.—West Vir-

ginia university has plans progressing for $770,000 mineral industries building; will apply for PWA grant.

Virginia

GALAX, VA.—City has authorized bond issue of $158,000 in addition to PWA grant of $129,000 for construction of proposed municipal electric system.

RICHMOND, VA. — State corporation commission has approved application of Virginia Electric & Power Co. to issue mortgage bonds and serial notes providing capital for erection of $3,500,000 addition to company's power plant.

Missouri

MONROE CITY, MO. — PWA has authorized grant of $32,000 to city for installation of 500-kilowatt diesel unit in municipal power plant; cost to be $72,000.

ODESSA, MO. — City has received approval of PWA loan of $77,000 and grant of $63,000 for construction of electric power plant, distribution system and street lighting system. Cost estimated at $140,000.

Oklahoma

CHELSEA, OKLA.—City has PWA grant on construction of additions to waterworks, including filtration plant, elevated storage tanks and extension in distribution system; cost to be $36,392.

PURCELL, OKLA. — City approved $65,000 bond issue to finance additions to electric light and power plant and changes in distribution system. Cost of project, $125,000; PWA granted $56,000 allotment.

Wisconsin

MILWAUKEE — Logemann Bros. Co., maker of hydraulic baling presses, has started work on erection of addition to shop, 40 x 120 feet. Eugene R. Liebert & Son, Milwaukee, architects.

Minnesota

BRAINERD, MINN. — PWA has authorized grant to the city, H. W. Creger, mayor, in construction of a steam generating station to cost $934,000. Burlingame, Hitchcock & Estabrook, Minneapolis, engineers.

MADISON, MINN. — PWA allots grant to city, J. H. Hayden, clerk, for $182,713 improvements to light, heat and power, and water plants. Perkins & McWayne, Sioux Falls, S. Dak., engineers.

NORTHFIELD, MINN. — City, John Larsen, clerk, has received approval of PWA grant on construction of proposed municipal electric power plant and distributing system to cost $356,000. Buell & Winter Engineering Co., Sioux City, Iowa, consulting engineers.

SOUTH ST. PAUL, MINN. — City, E. L. Sloan, recorder, has applied to PWA for a grant in the extension of its sewers and construction of treatment plant costing $960,551. W. H. Cropsey, city engineer.

WORTHINGTON, MINN. — PWA has allotted grant to city, C. S. Thompson, clerk, in the construction of an addition to boiler room at municipal power plant; cost estimated $154,632. Ralph D. Thomas & Associates, Minneapolis, consulting engineers. (Noted July 18).

Texas

AUSTIN, TEX.—City, Guiton Morgan, city manager, has received authoriza-

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1—Springfield 20" x 7' Universal
2—Bardons & Oliver 20"
1—Jones & Lamson 3" x 36"

VERTICAL BORING MILLS
1—6' Niles
1—12' Niles
1—7' Cincinnati
1—10' Cincinnati
1—3' King
1—6' King
1—60" Colburn
4—42" Bullard New Era type
2—36" Bullard New Era type
1—30" Bullard plain

HORIZONTAL BORING MILLS
1—No. 4 Beaman Smith
1—No. 2 Beaman Smith

FACING MACHINES
1—Ball Facing machine
1—Barret 3-way valve facing

GRINDERS
1—Pittsburgh Dry Tool grinder
1—Cincinnati No. 1 Universal cutter and grinder
1—Brown & Sharpe No. 3 Universal cylindrical grinder
1—Oliver No. 5 twist drill
1—Sellers No. 1 Universal grinder
1—6 spindle automatic grinder

SLOTTERS
1—Dill Slotter

BOLT & PIPE THREADING MACHINES
1—Acme 2" double head bolt threader
1—Acme 3" single head bolt threader
1—Acme 3½" single head bolt threader
1—Landis 2" Pipe threader
1—Landis 4" Pipe threader
1—Landis 6" Pipe threader
1—Landis 8" Pipe threader
1—Merrill 12" Pipe threader with Landis head

KEYSEATER
1—Baker Bros. No. 2
1—Warner & Swasey 16" double head key lathe

SPECIAL—Beardsley & Piper Sand Slinger

PLANERS
1—Detrick & Harvey 7' x 7' x 18' convertible open side
1—Niles Bement Pond 2 heads cross rail 2 side heads

RADIAL DRILLS
1—2½' American
1—4' American
1—6' American
1—5' Prentice
1—6' Prentice
1—7' Fosdick
1—3' Carlton

PLAIN DRILLS
1—4' Prentice
1—5' Prentice
2—6' Prentice
1—4' Bement
2—5' Bement
1—3' Carlton
1—40" Bement
1—20" Barnes

MULTIPLE SPINDLE DRILLS
2—Bausch 16 spindles
2—Bausch 8 spindles

TAPPING MACHINES
1—Baker 16" Vertical
1—Exeter 12" Vertical
1—Baker 4" Vertical
1—Exeter 6" Vertical
1—Saunders 8" Vertical

MILLING MACHINES
1—Brown & Sharpe No. 1 Universal
1—Cincinnati No. 4 Universal
1—American No. 0 Valve

VAN-STONE MACHINES
1—Pittsburgh flanging & Belling machine.
1—Niles 52" x 32' special turret head.
1—Lehman

AIR COMPRESSORS
2—Ingersoll Rand 14" x 14" x 12" type FRI steam driven
1—Worthington 15" x 8½" x 12" motor driven

GENERATOR SETS
1—220 K. W. steam driven
1—200 K. W. direct motor driven synchronous motor

MOTORS
1—H. P. to 75 H. P. Westinghouse-General Electric-Allis Chalmers A C & D C

FOUNDRY
2—36" x 66" cast iron tumbling mill
1—54" x 96" steel plate tumbling mill
Stripping plates, power squeezers, jaw squeezers, Case jolting machines, Osborne Little Wonder moulding machine, Herman roll over jolt moulding machines, portable snagging grinders, squeezer moulding machines, stripping jolt molding machines, Beardsley & Piper sand slinger, Standard sand mixer with revolving screen and conveyor bucket elevator, ladles, cast iron and steel flasks.

WATER TOWER
1—80,000 Gallon

MISCELLANEOUS
Vertical and horizontal testing machines, Brinell testing machine, power driven hack saw, triplex pumps—motor driven capstans, gasoline hoist engines, welding machines, forging hammer, Pangborn sand blast machine, alligator shears, layout & bending tables.

WOODWORKING EQUIPMENT
Hand jointers, swing saws, cut off saw, upright drill, planers, band saw, rip saw, wood trimmer.

PHONE . . . . WRITE . . . . WIRE

Complete data upon request

THOMAS J. LLEWELYN
911 Oliver Building
PITTSBURGH, PA.

tion from PWA of loan and grant totaling $350,000 for water and light plant improvements.

BIG SPRING, TEX.—City proposes waterworks system improvements and submits $275,000 bond issue to voters on Sept. 27. Freese & Nichols, Ft. Worth, Tex., consulting engineers.

COLUMBUS, TEX. — City votes at election Oct. 1 on $100,000 revenue bonds to build generating plant and complete distribution system costing about $156,000; application has been filed with PWA for grant.

LLANO, TEX. — City will vote Sept. 29 on $40,000 revenue bond issue for construction of proposed electric light and power system. (Noted Aug. 22).

LUBBOCK, TEX. — City, C. Slaton, mayor, approved bond issue providing for sewer system and sewage disposal plant to cost about $450,000.

LUFKIN, TEX.—PWA has allocated $117,000 to city for sewer and water system extensions; voters have approved bond issue of additional $150,000.

SCHULENBURG, TEX.—City will vote Oct. 1 on $75,000 bonds for construction of contemplated electric plant; is seeking PWA assistance in work.

TEAGUE, TEX. — PWA has authorized grant to city for construction of projected addition to diesel electric power plant; cost estimated at $40,000.

TEMPLE, TEX. — City holds election Sept. 29 on issuance of $275,000 bonds to finance waterworks and sewage improvements; PWA has allotted additional $225,000. Project includes construction of filtration plant, mains, sewage disposal plant and elevated storage tank. Koch & Fowler, Dallas, Tex., engineers.

Kansas

ARKANSAS CITY, KANS.—City, Clyde King, manager, plans to construct water softening plant to cost $183,900, and will vote on bond issue Sept. 30. Application has been filed for PWA aid. Black & Veatch, Kansas City, Mo., engineers.

AUGUSTA, KANS. — PWA approves grant to city, F. A. Garvin, mayor, for $81,740 improvements to its light and power plant.

COFFEYVILLE, KANS. — PWA has authorized grant on improvements in city's power plant, including turbogenerator, steam generating unit and switchboard costing total of $53,960. Black & Veatch, Kansas City, Mo., consultants on project.

OSAWATOMIE, KANS. — City, H. E. Newhouse, mayor, plans improvements in its waterworks and power plant to cost $200,000, and has applied for PWA grant. Engineer, Burns & McDonnell Engineering Co., Kansas City, Mo.

PITTSBURG, KANS. — City, George Dalton, commissioner, is applying for PWA grant in expansion of its sewage disposal plant and construction of new garbage disposal plant to cost about $190,000. Black & Veatch, Kansas City, Mo., engineers.

SOLOMON, KANS. — REA has allotted $386,000 to D. S. & O. Rural Electric cooperative, Timothy Kelly, president, to finance construction of 385 miles rural transmission lines in seven counties. E. T. Archer & Co., Kansas City, Mo., engineer.

North Dakota

JAMESTOWN, N. DAK. — State board of administration, A. B. Welch, Bismarck, N. Dak., secretary, will take bids about Oct. 15 on construction of power house addition costing $154,545; PWA has approved grant. W. F. Kurke, Fargo, N. Dak., engineer. (Noted July 11).

South Dakota

HOT SPRINGS, S. DAK. — Bureau of reclamation is planning construction of dam, 3000-kilowatt power plant and canal system to cost $4,337,270 on Cheyenne river.

Iowa

ALLISON, IOWA — City plans construction of a sewerage system and treatment plant costing $57,426 and has received PWA approval of a grant on project. Currie Engineering Co., Webster City, Iowa, consulting engineer.

CASCADE, IOWA — City, John Ludwig, mayor, proposes to construct municipal electric plant and distribution system costing $110,000, and has applied to PWA for a grant. Young & Stanley, Muscatine, Iowa, are consulting engineers.

LE MARS, IOWA — City, L. E. Crowley, is seeking PWA grant in the extension of its sewer system and construction of sewage treatment plant which will cost total of $152,500. Buell & Winter Engineering Co., Sioux City, Iowa, consultant.

MONTICELLO, IOWA — PWA has authorized grant to city, F. D. McLaughlin, mayor, in the construction of sewage treatment plant and sewers to cost about $58,400. Howard R. Green Co., Cedar Rapids, Iowa, is engineer for project.

REMSEN, IOWA — Board of trustees, Nicholas Holtz, chairman, is accepting bids to 10 a.m., Oct. 10, on enlargement of power plant, including installation of diesel electric generator and new water-cooling and oil-purifying systems; cost estimated $56,000. Buell & Winter Engineering Co., Sioux City, Iowa, consulting engineer. (Noted Aug. 15).

Colorado

DENVER — Bureau of reclamation takes bids to Oct. 10 on hydraulic turbines, oil pressure governors and generators for two power projects. Specification 802.

Utah

LOGAN, UTAH — George A. Bell Power Co. is making plans for construction of a hydroelectric power project which is to cost about $120,000.

Pacific Coast

LOS ANGELES — General Water Heater Co. has been issued building permit for construction of factory building in Burbank, Calif., to cost $50,000.

SAN FRANCISCO — Bureau of yards and docks, navy department, is receiving bids for steam turbine unit to be installed at navy yard, Mare Island, Calif.

EUGENE, OREG. — City proposes improvements in its electric light and power plant and has received approval of $274,833 PWA allotment.

SEATTLE — Pelican Cold Storage Co. is erecting a plant near Althorp, Alaska, and will award contracts for machinery and equipment. Representative, Arne Vesoja, 2309 Northlake avenue, Seattle.

ST. JOHN, WASH. — PWA has approved grant to city for construction of proposed $31,970 sewage disposal plant; bids will be called for soon.

SUNNYSIDE, WASH. — Voters approved $112,000 bond issue for reconstructing municipal water system and building a sewage disposal plant; PWA assistance is being sought.

Canada

MALTON, ONT. — National Steel Works, V. M. Drury, president, is participant in group soon to take bids for construction of assembly plant for government bombing planes; cost will be $600,000.

MALTON, ONT. — National Steel Car Co. Ltd. probably will be ready for bids soon on construction of proposed $500,000 addition to its factory.

ST. HUBERT, QUE. — Canadian Vickers Ltd., E. Labelle, Montreal, president, is interested in industrial group which will soon accept bids on construction of bombing plane assembly plant to cost $700,000.

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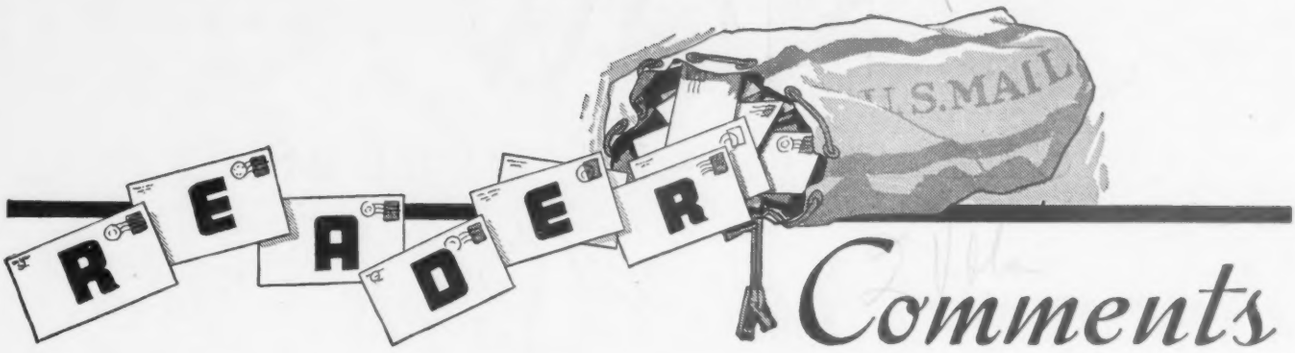

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Here's a Possible Solution

To the Editor:

With all the fumbling in an effort to boost industrial activity, pump priming and other plans, no real results seem to be obtained. Some time ago I saw a plan submitted by George Gibson of Montclair, N. J., in a letter to the *New York Herald Tribune*, which looks to me like a possible solution.

To give more positive encouragement to production the writer of the letter suggests reduction of income taxes and surtaxes to individuals reinvesting their income in equipment designed to increase production or provide work. He says:

"A reduction of corporation taxes might be made for corporations employing their surplus in a similar manner. The building of low-rent housing, purchase of farm equipment and stock, financing of retail outlets and similar useful work-providing activities should be included, as well as investments in big industry.

"The immediate result would be re-employment. Every man with surplus income would wish to invest it directly or indirectly in machinery, houses or other goods. If, for instance, income tax and surtax are cut in half on money invested, then to avoid payment of a $3 tax, the millionaire, taxed at 60 per cent, would have to invest $10. The man of moderate means, taxed at, say 8 per cent, would invest $100 to avoid paying $4 tax. . .

"The real winner would be the worker. With capital competing for employment, interest rates would drop, capital would work for low wages and the share of labor would be increased. The worker would have work and he would be able to buy his needs at low prices. He, in turn, would have a surplus and become a capitalist."

This plan is so radically opposed to the present system of penalizing money invested in productive enterprises, through the undistributed profits and other taxes, that the New Deal scarcely can be expected to see the value of the idea. But it looks well as a suggestion, even if it does not soak the rich.

SMALL INVESTOR

Gary, Ind.

Obsolescence a Blessing

To the Editor:

Obsolescence in industry has been discussed widely in recent years and economic advantages of replacing tools and machinery by more modern units, which reduce costs and give better product, have been set forth by many speakers and writers.

A different approach was made by E. J. Kulas, president of Otis Steel Co., in discussing (STEEL, Sept. 19, p. 107) trends of steel's role in our expanding economy. He said:

"Premature obsolescence may be hard to reconcile, but any steel producer should promptly recognize that but for obsolescence of the products into which his tonnage finds its way, industry would soon bog down and volume would dwindle faster and faster as each successive need was met."

With this picture in mind the steelmaker can be philosophical about scrapping a rolling mill that has been outmoded by the newer and more efficient plant that makes better steel products at lower cost. Mr. Kulas likens this to trading in an old automobile, still serviceable but less efficient than the later model.

It is an interesting thought that constant progress in methods and equipment sustains industry by rendering obsolete yesterday's product when compared with today's. If automobles did not wear out this outlet for steel would almost disappear. If new tools were not developed to do better work at less cost steelmakers would lose another outlet.

It is among the possibilities that the efforts of engineers to build better cars may have succeeded to the point that the term of their usefulness has been extended sufficiently to reduce the number of replacements. Perhaps this is a cause of the lower rate of production experienced recently.

Mr. Kulas' analysis of the simultaneous development of the continuous mill and the streamlined automobile covers an important chapter in the nation's development, since many other steel uses developed at the same time, a result of superior quality, adapting it to products previously using other materials. I think his article was an illuminating presentation of the broad features of the industry.

AUTO ENGINEER

Detroit

No Profit in War

To the Editor:

Let us hope the world will be spared the fictitious prosperity that accompanies war and the very real depression in the readjustments that follow. Everybody loses from a war, even the neutral nations.

The lessons taught by the struggle of 1914-18 are too vivid in the public mind to allow any false ideas of profit to obscure the real situation. Many people believe vast gains result from sale of munitions and other material used by armies. There may be individual instances of this but the bill must be paid by the whole world for the waste of material.

Let us rejoice that wise counsels are deferring the struggle and hope may be felt for averting it altogether.

TOOL BUILDER

Cleveland

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